Connecting the Systems that Power Education

Edustructures SIF Agent for SASI™

User's Guide

Release 1.7

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Contents

Part I

OVERVIEW & INSTALLATION

1. Overview

Features

- SIF 1.5r1 Compliant. Supports all versions of SIF 1.0r1 and later
- Works in SIF environments where multiple versions of the Schools Interoperability Framework are in use. The agent automatically adjusts the way it performs depending on the version of messages received from the zone integration server.
- Scalable. Supports multiple zones for centralized deployment. The agent can connect to as many zones as necessary from a single server, limited only by available memory, processor speed, and network bandwidth.
- Configurable. Numerous configuration options, including the mapping between SASI fields and SIF Data Object fields, can be customized to meet the specific needs of your district. Most aspects of the agent can be configured on a zone-by-zone and SIF version-by-version basis to accommodate the unique integration requirements of each SIF Zone.
- Reliable. The agent can be installed as an NT Service for uninterrupted operation on the Windows NT, 2000, and XP platforms. In addition, it will automatically recover when the connection to the zone integration server or SASI database is broken and performs daily automatic backups of its configuration files and Object IDs database.

Requirements

- SASI 6.5 or later (7.0 or later recommended)
- Supports dBASE IV, Microsoft SQL Server, and Oracle databases
- Microsoft Windows 2000, Windows XP, or Windows 2003
- Java 5.0 Runtime Environment (J2RE) or later

How It Works

The Edustructures SIF Agent for SASI™ is a middleware component that enables real-time data exchange between the SASI student management system and applications

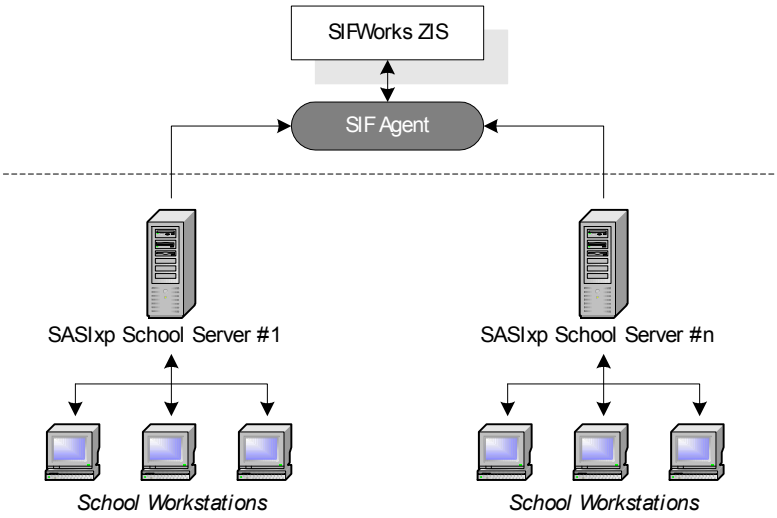
that support the Schools Interoperability Framework. The agent communicates with the SIFWorks® Zone Integration Server, the central messaging hub in the SIF architecture, to report changes in SASI records and to respond to requests for information from SIF-enabled applications.

Where is the Agent Installed?

The SASI agent can be installed in both centralized and distributed configurations:

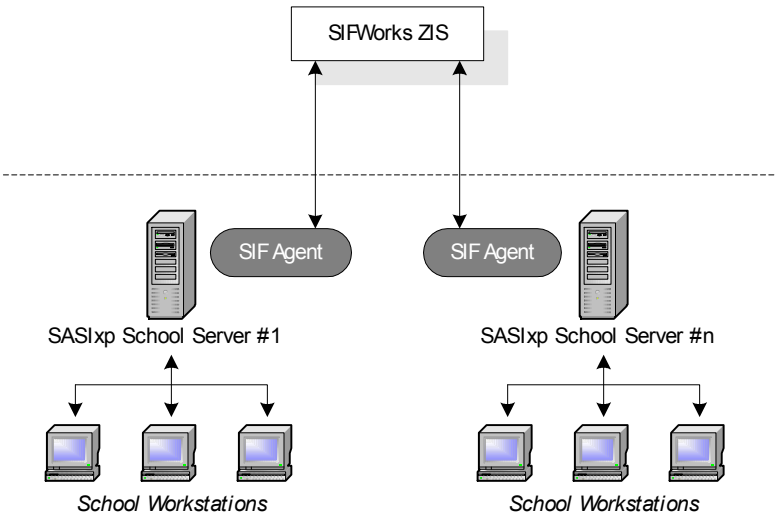
- **Centralized**

  When centralized, the agent is installed on a server at the district office where it can communicate with each SASI school server. Centralized installation offers ease of management at the expense of some performance as data must be read from SASI databases over the network. (Note the agent does not take part in SASI District Integration procedures. Instead, it works with each school on a local basis so data exchange can take place in real-time.)



- **Distributed**

  If network topology or bandwidth limitations prevent the agent from being installed centrally, it can be located on the same server as SASI or on another computer at each school. The distributed approach offers the best performance but is more difficult to manage.



Object ID Database

There are two components to the SASI agent:

- The SIF Agent software
- The Object ID Database

The Object ID Database is a small relational database that stores the identifiers—also known as *RefIds*—for all SIF Data Objects published by the SASI agent. A RefId is a globally unique number that associates a SIF Data Object with its corresponding records in the SASI database. RefIds make it possible for all applications that participate in a SIF Zone to refer to objects by a number that is not specific to any one application.

Only one instance of the Object ID Database is required to serve your entire district. When installing multiple instances of the SASI agent in a *distributed* fashion, we recommend centralizing the Object ID Database. In other words, install one instance of the database on a central server (e.g. the same computer where the SIFWorks® zone integration server is installed) and multiple instances of the SIF Agent software, one at each school. These will all use the centralized database for Object ID storage. This approach makes it possible to move agents around at a later date without having to merge the Object ID Databases of each school.

After a SASI New Year Rollover procedure has been completed, the identifiers in the Object ID Database must be reconciled with student identifiers for the new school year. This mandatory procedure is handled by the agent's New Year Rollover Wizard, described in detail in Part IV of this guide.

SIF Zones

The SASI agent is designed around a "one school per zone" model in which each school in your district is represented by a unique SIF Zone. A zone is a logical grouping of data objects and administrative applications that can share objects with one another. The SASI agent supports multiple zones, which means it can connect to more

than one zone at a time much like an e-mail program can send and receive messages from more than one e-mail server.

Version 1.5 of the SASI agent introduces the concept of "aggregate zones". Aggregate zones let you combine one or more school zones into a single zone for easier vertical reporting. For example, you could create an aggregate zone named "DISTRICT" to represent all schools in the district. Agents that request data from this zone would then receive records from all SASI schools without having to connect to each school zone individually.

SIF Request & Response

When applications request data from SASI through the SIF infrastructure, the agent queries the SASI database for records, converts the results to one or more SIF Data Objects, and then returns the results to the zone integration server. The server forwards the responses to each of the requesting applications securely and reliably. You can prevent certain applications from requesting specific types of data by using the Access Control features of the zone integration server.

The following types of records and SIF Data Objects are currently supported:

SASI Record Type	SIF Data Object Type
Basic Student Enrollment	StudentSchoolEnrollment
Class Schedule	StudentSectionEnrollment
Courses	SchoolCourseInfo
District	LEAInfo
Parent/Guardian	StudentContact
Rooms	RoomInfo and RoomType
School	SchoolInfo
Section	SectionInfo
Staff	StaffPersonal
Students	StudentPersonal
Students	StudentSnapshot
Teachers	StaffPersonal
Term	TermInfo

▸ NOTE: Refer to the "*Edustructures SIF Agent for SASI—Supported SIF Data Objects*" document for a detailed description of the SIF Data objects and elements that are provided by the agent.

SIF Event Reporting

When changes are made to a record in SASI, details of the change are recorded in the AEVT Event Transaction Log global data file. The agent periodically reads from this file to report database changes to the zone integration server. When a SIF Event is reported, it is sent to the school zone associated with the data as well as to all aggregate zones of which the school is a member. Event reporting occurs every 60 seconds by default. You can increase or decrease this frequency or turn off Event Reporting altogether from the agent's Settings dialog box.

SIF Subscription

SIF Agent for SASI 1.5 allows StudentPersonal Change Event subscription. This subscription allows SASI to receive SIF Event information that is reported by other applications. For example, if the name of a student is changed in the library, or the address

of a student is updated in the transportation system, those changes will be propagated to SASI.

How do I Run the Agent?

The Edustructures SIF Agent for SASI is designed for unattended operation. It is installed as an NT Service on the Windows NT/2000/XP platform. As a service, the agent runs whenever the server is running, regardless of whether or not a user has logged in to that computer. You can stop, start, or restart the service from the Windows Services Manager.

The agent can also be run as a "standalone" application by choosing the "SASI Agent - Run Standalone" command from the Edustructures program group on the Windows Start Menu, or by running the SASIxpAgent.cmd batch file from the agent's directory.

▸ NOTE: Only one instance of the agent can be running on a given computer. If you start the agent as a standalone application and it is already running as an NT Service, the agent will prevent itself from running a second time.

How do I Configure and Manage the Agent?

The agent features a graphical console from which configuration and management tasks are performed. To display the console window, click the blue and yellow SIF logo on the taskbar near the system clock:

New Year Rollover Procedure

Like SASI, the SIF Agent requires that a New Year Rollover procedure be performed in order to reconcile the student identifiers recorded by the agent's Object ID Database with corresponding records in the SASI database. This procedure must be started at the end of the current school year **before** performing the SASI New Year Rollover, and again at the beginning of the new school year **after** that procedure has been completed.

The agent includes a New Year Rollover Wizard to automate this process, but you must remember to run it before and after the SASI rollover procedure. Refer to Part IV of this guide for instructions on New Year Rollover procedures.

2. Installation

Java

The agent requires that a Java 2 Runtime Environment (JRE) version 1.4 or later be installed. To determine if Java is already installed on your system, open a command prompt and issue this command:

```
java –version
```

If you receive a message that "java" is not recognized as an internal or external command, the Java 2 Runtime Environment is not installed. Visit the Sun website at `http://java.sun.com` to download the latest version.

You can also download a version of the Edustructures SIF Agent for SASI installation program that includes a Java virtual machine.

Installer

The installer performs these tasks:

- Optionally installs the Java 1.4 virtual machine
- Copies the program files to your computer
- Optionally installs the "Edustructures SASI Agent" Windows Service
- Installs the "Edustructures SASI Agent Database" Windows Service
- Creates items on the Windows Start Menu

To run the installer, double-click the `installer.exe` executable and follow the instructions.

Components

There are two components to the Edustructures SIF Agent for SASI:

- The SIF Agent
- The Object ID Database

The installation program gives you the choice of installing one or both of these components.

The SIF Agent

The agent is an independent program that can be installed on a central computer or on each computer where SASI is installed. By default, it is installed in the `\SIFAgents\Edustructures\SASIAgent` directory.

The Object ID Database

The Object ID Database is a small relational database for the SASI Agent that stores SIF identifiers on behalf of SASI. It is installed as a Windows Service and must be running when the agent is running. One instance of the Object ID Database must be installed at the district so the agent can keep track of the relationship between records at each school and corresponding SIF Data Objects.

By default, the installer will install both the SIF Agent software and the Object ID Database on the same computer, which is appropriate for centralized installations. For distributed installations, follow the steps in the "Distributed Installation" section below to install a single instance of the SASI Agent with a single instance of the Object ID Database at the central office, with a single instance of the SIF Agent software (without the Object ID Database) installed at multiple schools throughout the district.

Installation Types: Centralized and Distributed

There are two types of installation for SASI Agent: centralized and distributed. Selecting the appropriate type of installation depends on how your district is configured.

- **Centralized Installation —** A centralized installation installs both the SASI Agent and the Object ID Database on the same server at the central office. This centralized SASI Agent uses the network to query data from various SASI applications located throughout the district.

  If your district uses dBase IV for the SASI application database, and your network connection is relatively fast between the central office and each school, you should perform a centralized installation. Also, if your district uses Microsoft SQL Server or Oracle as the SASI Agent database, you must perform a centralized installation. Most districts use a centralized installation, which is the preferred installation type.

- **Distributed Installation** — A distributed installation installs the SASI Agent and the Object ID Database on the same server at the central office, and also installs additional instances (copies) of the SASI Agent software (without the Object ID Database) for SASI applications installed at schools throughout the district.

  If your district uses dBase IV for the SASI application database and the district has a relatively slow connection between the central office and each school, you should perform a distributed installation. This installation accommodates a slow network, because individual SASI Agents query their respective SASI applications located on their same server, requiring minimal network traffic. Distributed installations are relatively rare.

Use the table below to select the appropriate installation type for your district.

If Your District …	Then Your District …
Uses dBase IV for the SASI application database, and the network connection is relatively fast between the central office and each school	Should perform a centralized installation. Most districts use a centralized installation, which is the preferred installation type.
Uses dBase IV for the SASI application database, and the network connection is relatively slow between the central office and each school	Should perform a distributed installation. Distributed installations are relatively rare.
Uses Microsoft SQL Server or Oracle as the SASI Agent database	Must perform a centralized installation. Most districts use a centralized installation, which is the preferred installation type.

Performing a Centralized Installation

A centralized installation installs both the SASI Agent and the Object ID Database on the same server at the central office. The centralized SASI Agent uses the network to query data from multiple SASI applications located throughout the district.

A centralized installation is appropriate if your district uses dBase IV as the SASI Agent database and has a relatively fast network connection between the central office and each school, or if you use Microsoft SQL Server or Oracle as the database for the SASI Agent. Most districts use a centralized installation, which is the preferred installation type.

Follow the steps below to perform a centralized installation.

1. Run the installer.exe executable at a server at the central office

2. When prompted to choose components to install, select "SIF Agent & Database"

3. Follow the steps in Part II of this guide to configure the agent to connect remotely to each SASI database instance and school zone

Performing a Distributed Installation

A distributed installation installs:

- A single instance of SASI Agent and a single instance of the Object ID Database at the central office, and
- Additional instances (copies) of the SASI Agent software (without the Object ID Database) for SASI applications installed at multiple schools throughout the district

▸ IMPORTANT: Distributed installations are rare and applicable only to dBase IV users. A distributed installation is only appropriate if your district uses dBase IV for the SASI application database, and the network connection is slow between the central office and each school.

Follow these steps to perform a distributed installation. The server where you install the Object ID Database must have an IP address that can be reached from all other SASI school servers on the network. Edustructures recommends using the same server where the SIFWorks® ZIS is installed.

1. Run the `installer.exe` executable at a server at the central office
2. When prompted to choose components to install, select “SIF Agent & Database”

Now follow the steps below to install a copy of the SIF Agent (and not the database) at each school. The agent should be installed on a computer that has local access to the SASI data file folders.

1. Run the `installer.exe` executable at each school

2. When prompted to choose components to install, select "SIF Agent Only"

3. After the installation is complete, you will need to modify the agent's configuration file to instruct it to connect to the Object ID Database at the central office. Using Notepad or another text editor, open the `agent.cfg` file in the agent's installation directory (e.g. "`\SIFAgents\Edustructures\SASIxpAgent-1.1`").

   Locate the following lines:

   ```
   <database>
      <property name="driver" value="org.hsqldb.jdbcDriver"/>
      <property name="user" value="sa"/>
      <property name="password" value=""/>
   </database>
   ```

   Add a fourth property to this group of settings:

   ```
   <property name="url"
      value="jdbc:hsqldb:hsql://192.168.1.14:16010"/>
   ```

   Make sure to specify the real IP address of your central server. The address 192.168.1.14 above is an example.

The resulting <database> section should look something like this:

```
<database>
    <property name="driver" value="org.hsqldb.jdbcDriver"/>
    <property name="user" value="sa"/>
    <property name="password" value=""/>
    <property name="url"
       value="jdbc:hsqldb:hsql://192.168.1.14:16010"/>
</database>
```

4. Save the file

If the "Edustructures SASIxp Agent" service was started by the installation program, restart it from the Windows Service manager for the new settings to take effect.

Running the Agent

The SASI agent is installed as a service on Windows 2000 and XP platforms. When the service is running, the agent will respond to requests from the SIFWorks® zone integration server and continually monitor SASI databases for changes made to records. When the agent service is not running—for example, while the computer is starting up or if you have taken the agent down for maintenance—SIF messages will be safely held in the agent's queue on the zone integration server until the service is again started.

Starting & Stopping the Service

Follow these steps to start and stop the service:

1. Open the Windows Service Manager.

   There are many ways to open the Service Manager. On Windows 2000 and XP, the easiest method is to right-click My Computer on the desktop, and then choose Manage from the pop-up menu. The Computer Management window appears. Expand the "Services and Applications" node in the tree, and then select the Services entry to view all services on your computer.

2. Highlight "Edustructures SASIxp SIF Agent"

3. Start, Stop, or Restart the service

You will need to return here to restart the service whenever you make changes to the agent configuration.

Running the Agent as a Standalone Program

When the SASI agent is run as an NT Service, there is no visible "console" from which to view its activity. Occasionally it is useful to run the agent as a standalone program instead of as a service. This is particularly helpful during initial installation and configuration as well as when trying to isolate a problem.

To run the agent in standalone mode,

1. Make sure the Edustructures SASI Agent service is stopped if currently running. You cannot run both the NT Service and the standalone agent at the same time.

2. Choose "SASIxp Agent – Run Standalone" from the **Start Menu > Programs > Edustructures** menu

The agent will run in a Windows command console. To stop the agent, press Ctrl+C or open the agent console window and choose Exit & Shutdown from the File menu.

The Taskbar Icon

When the SASI agent is running—either as an NT Service or in Standalone mode—a blue and yellow SIF logo appears on the Windows taskbar near the system clock. Click the icon to open the SASI Agent Console.

Note the icon appears gray when the agent is starting up or shutting down. If the icon is missing from the taskbar, it probably means the agent is not running.

Part II

INSTALLATION QUICKSTART

3. Overview

Agent configuration is an important step in the deployment of SIF Zones. The SASI agent is highly customizable, designed to meet the needs of even the most demanding SIF integration project. Configuration choices made for the SASI agent depend to a large extent on the requirements and capabilities of other SIF agents in use at the district. You may need to revisit the agent's configuration later on when deploying new agents that subscribe to the SIF Data Objects published by SASI.

We divide configuration into two parts: Basic Configuration and Advanced Configuration. Basic configuration involves those steps that are essential to connecting the agent to both the SASI™ student information system and the Zone Integration Server. Advanced Configuration involves fine-tuning to address specific integration challenges.

This chapter covers the basic configuration tasks that are mandatory for the successful operation of the agent. Depending on the other SIF-enabled applications at the district, you may need to perform additional customization tasks as discussed in Part III of this guide.

Configuration Overview

Configuration of the SASI agent involves the following tasks, each of which must be performed once for each SIF Zone and SASI school the agent will connect to.

- SASI Configuration
  - Set options in the `sasixp.ini` file
  - Create the Event Transaction Log
- SASI dBase IV
  - Have proper permissions to the SASI folder with the dBase IV files
- Zone Configuration
  - Add each zone to the agent
  - Adjust global and zone-by-zone settings as needed

4. SASI Configuration

The SIF agent relies on features designed into the SASI application to support the Schools Interoperability Framework. In particular, the "database monitoring" feature captures changes made to records in the database so they can be reported as SIF Events by the agent. SIF Events notify other applications of added, changed, and deleted records in real-time. By default, the database monitoring feature is disabled when SASI is installed. It must be turned on by following the steps below for each instance of SASI.

Repeat the steps below for each school to which the agent will connect.

Enable Database Monitoring

1. Open the **sasixp.ini** file in Notepad. This file is located in the SASI directory.

2. Ensure the following 4 lines are present at the end of the file, and that the **UseMonitoring** and **UseEnrMonitoring** entries are set to a value of True. The last entry, **UseAttendMonitoring**, should be set to False in this version of the agent. If the lines are not included in your copy of sasixp.ini, add them to the end of the file exactly as shown below.

```
[Monitoring]
UseMonitoring = True;
UseEnrMonitoring = True;
UseAttendMonitoring = False;
```

SASI must be restarted for these changes to take effect.

Create the Event Transaction Log (AEVT)

The Event Transaction Log is a global SASI data file that stores a journal of changes made to records subject to database monitoring. Because database monitoring occurs regardless of whether the SIF Agent software is running or not, changes are queued in this file until they can be successfully reported to SIF.

By default, the AEVT file does not exist. Follow the instructions below to create this file in each instance of SASI:

1. Log in to SASI

2. Open the **Create New Files** atom in the **File Management** folder

3. Check the **Use Database Definition** checkbox at the bottom of the Create New Files window

4. Scroll down to the **AEVT – Event Transaction Log** entry. If the "Created" column is empty, click the Create button to create the AEVT file.

Database Configuration

Once you've performed the above steps for each instance of SASI, it's time to set up the agent to communicate with the SASI database. The agent supports three database configurations:

- dBASE IV
- Oracle
- Microsoft SQL Server

Follow the instructions below for the type of database your district uses.

dBASE IV

The SASI agent uses a Universal Naming Convention (UNC) path when connecting to dBase IV. The UNC will point to the desired zone in the SASI folder that resides on the server. The SASI folder must have Read/Write/Modify permissions for the SIF agent to install and function properly.

Oracle

The agent connects to Oracle databases directly without the need for an ODBC driver. To configure the agent to connect to your Oracle server, please gather the following information before proceeding to the chapter on Agent Configuration:

- The IP address of the Oracle server
- A username and password with permissions to access the SASI database

Microsoft SQL Server

The agent connects to Microsoft SQL Server databases directly without the need for an ODBC driver. To configure the agent to connect to SQL Server, please gather the following information before proceeding to the chapter on Agent Configuration.

- The IP address of the SQL Server
- A username and password with permissions to access the SASI database
- If the owner of SASI tables is different than the username used to login to SQL Server, you must type the owner name into the SASI agent. When the agent queries records from SQL Server, it will prefix each table name with this owner name.

5. Agent Configuration

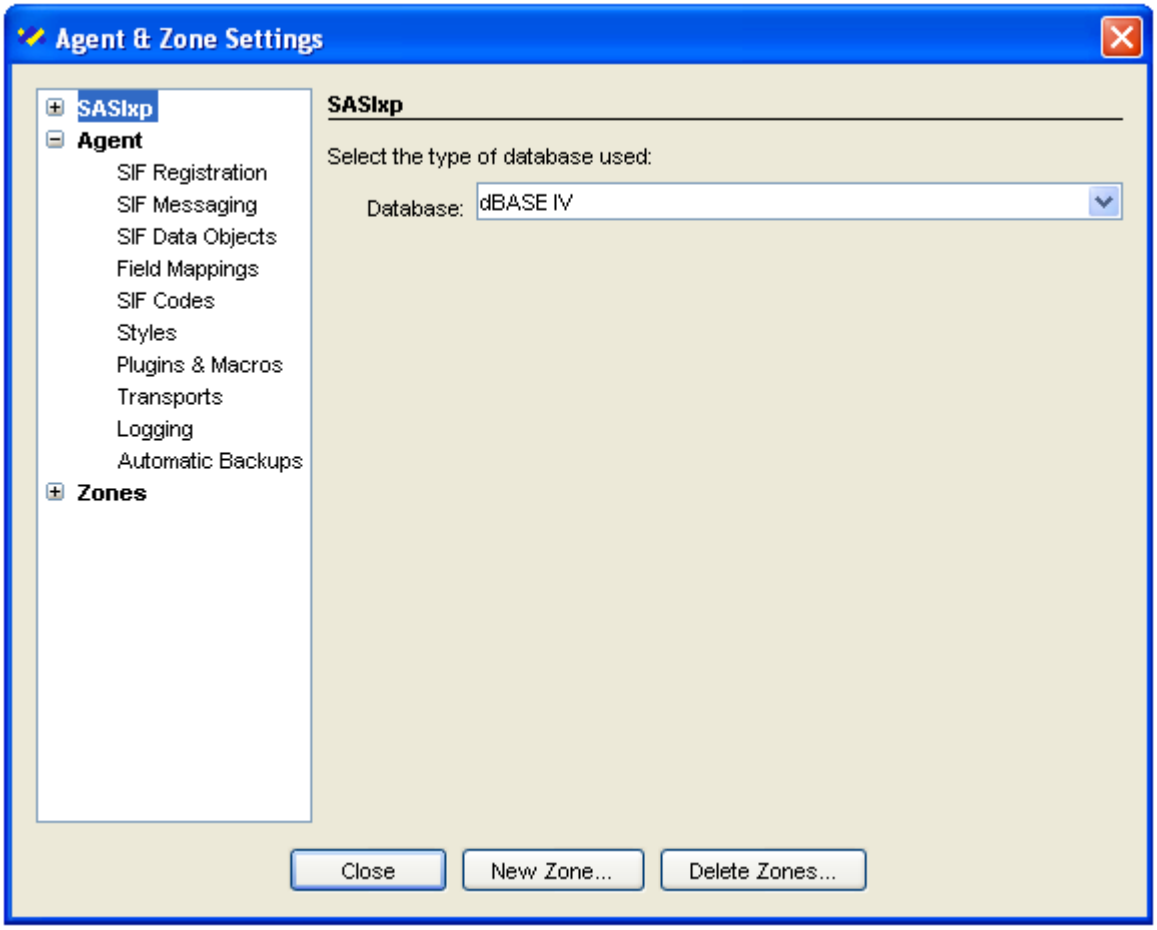
Once each instance of SASI has been configured as outlined in the previous section, you're ready to configure the settings of the agent. The agent's factory default settings are appropriate for most installations.

Settings Dialog Box

All agent and zone settings are configured from the Console's **Agent & Zone Settings** dialog box. To open this dialog box,

1. Start the agent if not already running
2. Click on the SIF logo on the system tray to open the Console
3. Choose **Settings** from the Tools menu

The Agent & Zone Settings dialog box opens:



Settings are arranged in a tree shown to the left of the dialog box. To edit a group of settings, click a node in the tree.

SASI Options

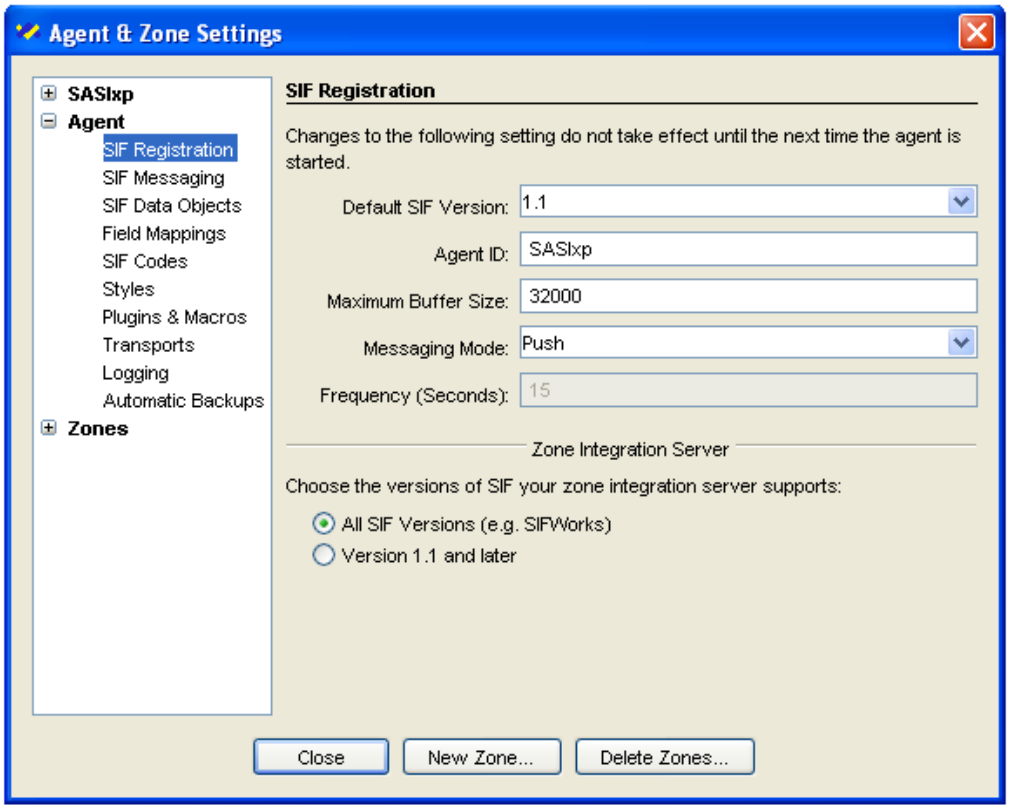
Database Type

The **SASI** group of settings applies to all zones to which the agent connects. Here you can choose the type of database your district uses: dBASE IV, Oracle, or SQL Server. Note you must choose a value for this setting before creating new zones.

1. Click the **SASI** node in the tree
2. Choose the database type from the drop-down list
3. If you're using dBASE IV, no additional database settings are required.
4. If you're using Oracle or SQL Server, fill in the database connection parameters.

SIF Registration Settings

SIF Registration settings control how the agent registers with zones managed by the SIFWorks® zone integration server. The factory defaults are recommended for most installations.



In order to send and receive messages from a SIF Zone, the Schools Interoperability Framework requires that each agent "register" with the zone. During registration, the agent sends a series of commands to the server informing it of various operational settings such as the name of the agent, whether it will use Push or Pull mode to retrieve messages waiting in its queue, the maximum size of messages the agent can receive, the SIF Data Objects the agent provides and subscribes to, and so on. Once registered, an agent remains in this state until it sends the server a command to unregister or until manually deregistered by the ZIS administrator.

The SASI agent performs the registration process automatically at startup. If it cannot connect to a zone because of an error or because the zone integration server is off-line, it will periodically retry until a connection is established.

Default SIF Version

This setting specifies the version of the SIF specification that the agent uses to report SIF Events to zones. Although the SASI agent can receive and process messages in any version of SIF—including 1.0r1, 1.0r2, 1.1, and 1.5—it will only report SIF Events using the version of the specification chosen here.

Factory Default
The factory default is SIF 1.5r1

When to Change
Administrators must choose the version of SIF the agent will use to report SIF Events. Select the version that is used by the majority of your subscribing agents. SIF 1.5r1 specifications dictate that a given message can only be delivered to those agents that support the version of SIF used to produce the message. Consequently, if a subscribing agent does not support the version of SIF selected here, it will not receive SIF Events from SASI (messages destined to this agent would be discarded by the zone integration server).

Agent ID

This setting specifies the name the SASI agent is known by in the zone. With the SIF-Works zone integration server, you must first add the SASI agent to each zone using this name before the agent will successfully connect. The default is "SASIxp", which is case-sensitive.

Factory Default
The factory default is "SASIxp"

When to Change
Administrators rarely if ever change this setting. If changed, the agent must be restarted and re-registered in each zone.

Maximum Buffer Size

This setting specifies the maximum size of messages that can be received by the SASI agent.

Factory Default
The factory default is 32,000 bytes

When to Change
Administrators rarely change this setting

Messaging Mode

This setting determines whether the agent will use Push or Pull mode to retrieve messages waiting in its queue on the zone integration server. "Push" mode means the server will send messages to the agent as soon as they become available in the agent's queue. This mode requires that the server be able to communicate with the agent's IP address and port.

In cases where a firewall sits between the agent and ZIS, or when the agent is running on a non-routable IP address that cannot be contacted by the ZIS, "Pull" mode can be used. Pull mode is much less efficient than Push mode because the agent must periodically send commands to the server to check for new messages in its queue. However, Pull mode makes it possible for the agent to exchange messages with the server even if the server cannot "see" the agent because of network or firewall configuration issues.

Factory Default
The factory default is Push mode

When to Change
This setting is usually selected at installation time and not changed thereafter. Changing the messaging mode requires the agent be restarted. If one instance of the agent is connected to many zones (e.g. over 25), Pull mode is not recommended because the agent will spend much of its free time checking for new messages. If you are connecting a single instance of the agent to many zones and must use Pull mode, make sure to expand the Pull Frequency to the 5-15 minute range. This will give the agent ample time to send its Pull requests to each zone before repeating the process.

Pull Frequency (Seconds)

This setting is valid only when Messaging Mode is set to "Pull". It defines the number of seconds between Pull requests. A lower value will cause the agent to spend more time checking for messages, while a higher value (e.g. 10 minutes or 600 seconds) will still achieve the near "real-time" interoperability SIF is famous for while greatly reducing network and processing overhead.

Factory Default
The factory default is 30 seconds

When to Change
Optionally change this setting when changing the Messaging Mode to "Pull", or if you determine a faster or slower polling frequency is warranted.

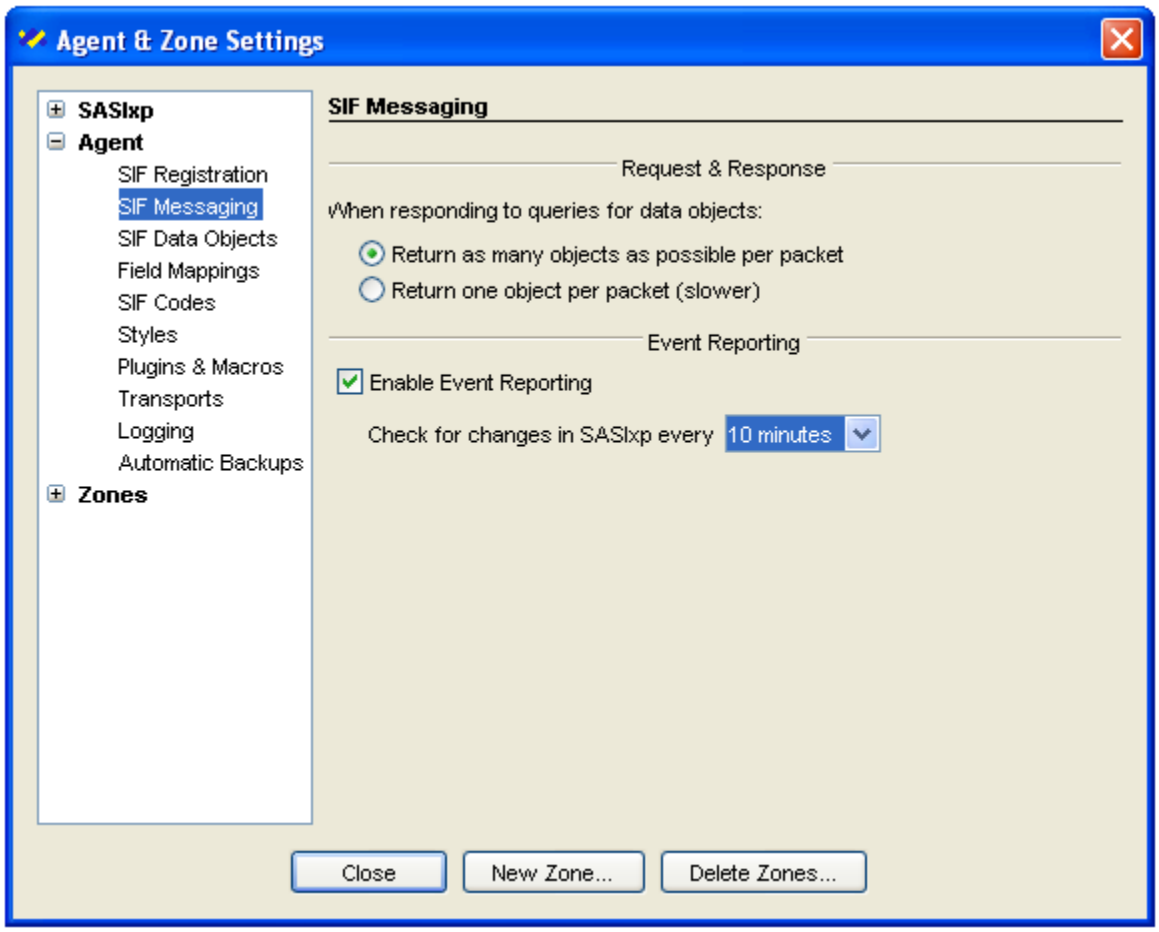
Zone Integration Server — Supported Versions

This group of settings controls how the agent registers with the zone integration server. Some ZIS products on the market do not allow agents to register in support of SIF versions older than 1.1. If connecting to a zone integration server that enforces this restriction, choose the "Version 1.1 and later" radio button. If connecting to the Edus-

tructures SIFWorks® Enterprise ZIS, which supports all versions of the Schools Interoperability Framework, choose the "All SIF Versions" radio button. This is the factory default.

SIF Messaging Settings

SIF Messaging settings control how the agent sends responses to queries and how often it checks SASI for changes in record data. The factory defaults are recommended for most installations, although you may wish to decrease the Event Reporting frequency to reduce network traffic and access to the SASI database files.



Request & Response

This group of settings controls how the agent sends responses to queries. If the "Return as many objects as possible per packet" radio button is selected, the SASI agent will fit as many objects into each response message as possible. The requesting agent's maximum buffer size is used to calculate the size of response packets. For example, if a requesting agent with a maximum buffer size of 100K bytes queries SASI for all student records, the agent will divide the responses into chunks of 100K, perhaps resulting in a few dozen messages depending on the number of students in the school. This approach results in the optimal number of packets, thereby reducing network and processing overhead.

In some cases, particularly during diagnostics, it may be desirable to have the agent respond to queries with a single packet per object. To enable this mode, select the "Return one object per packet (slower)" radio button. For example, if a requesting agent issued a query for all students and 1200 students were enrolled in the school, the SASI agent would respond with 1200 individual packets, each consisting of one student object. This mode results in much slower overall processing by the requesting agent because it must process many more messages.

Factory Default
The factory default is "Return as many objects as possible per packet"

When to Change
Change this setting to "Return one object per packet" only when it is easier to diagnose problems if query responses are packaged into individual response packets (e.g. one record in a response is resulting in an XML Validation error but you're not sure which one). Once you've isolated the problem, revert to the "Return as many objects as possible per packet" setting.

Event Reporting

This group of settings controls how the agent reports SIF Events when changes are detected in the SASI database.

Use the "Enable Event Reporting" checkbox to enable or disable event reporting. When disabled, the agent does not periodically check the SASI Event Transaction Log file (AEVT) for changes. Any changes made in SASI's database will be queued in this file until event reporting is enabled again.

When Event Reporting is enabled, the agent polls the AEVT file at regular intervals. The "Check for changes in SASIxp every N seconds" setting specifies the polling frequency. A lower number will result in slower performance because the agent reads from the SASI database more often. However, changes made in SASI will appear in subscribing agents more quickly. A larger value, such as 10 minutes, is recommended because the agent will spend less time checking for changes yet they're still reported to subscribing applications in relatively quickly—at most 10 minutes after the change is made in SASI.

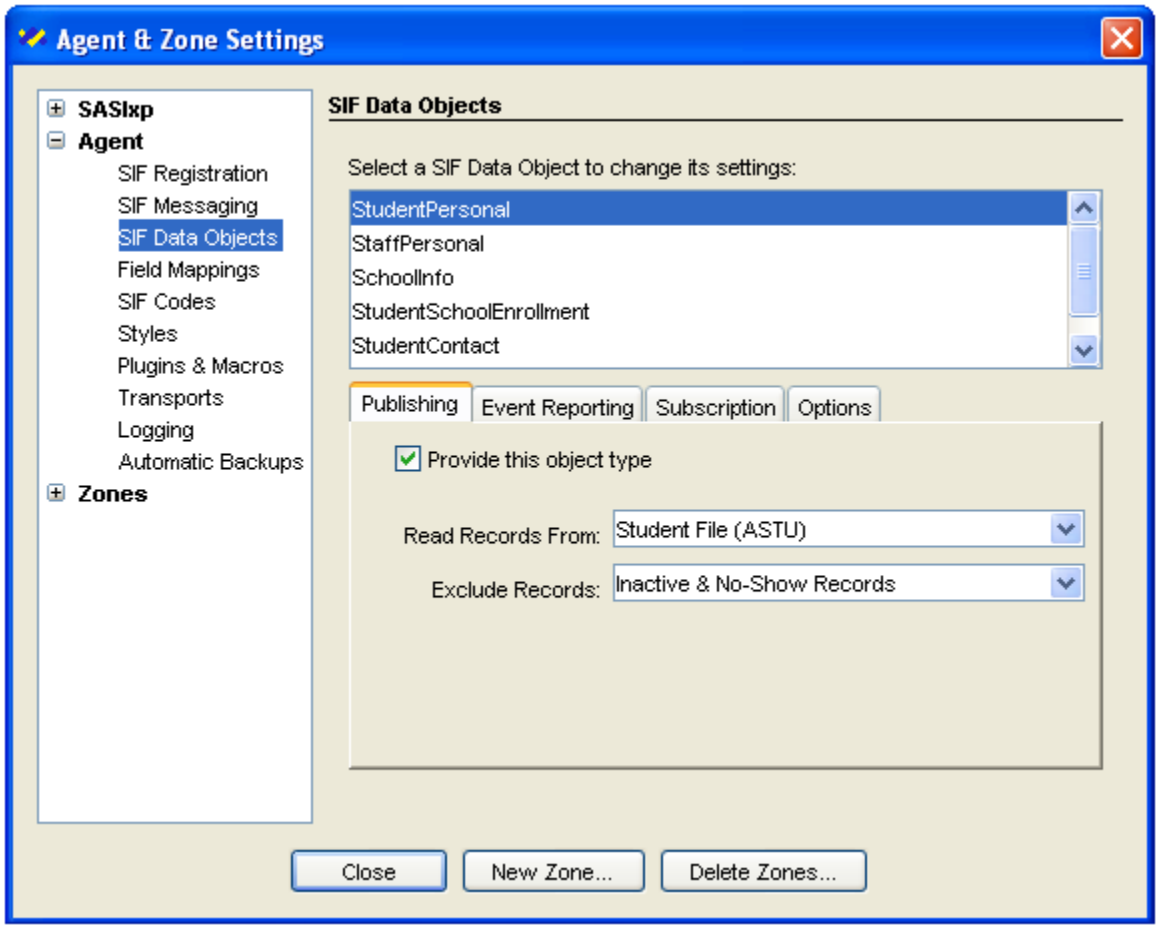
As with all time-based settings, lower values are usually selected when diagnosing problems or learning the system. For example, when testing that Event Reporting is working properly, it is tedious to wait 10 minutes for a sample change in SASI to be reported. A much smaller setting of 15 seconds, while unnecessary for a production environment, is easier to work with during testing.

Factory Default
The factory default is 30 seconds

When to Change
Decrease the polling frequency by setting this value to a larger number such as 10 minutes after you've installed the SASI agent and have successfully tested that event reporting is working as expected.

SIF Data Objects Settings

This group of settings controls how the agent publishes and reports events for the SIF Data Objects supported by the agent.



To change the properties of a SIF Data Object, select it in the list. Most objects offer three of four tabs depending on its capabilities:

- **Publishing.** These options determine whether the SASI agent registers in SIF Zones as the authoritative provider of this type of object. For most object types you can configure additional settings that control how records from SASI are published to SIF.

- **Event Reporting.** These options determine the kinds of actions in SASI that will result in SIF Events reported to zones. For most object types you can enable or disable the reporting of added, changed, and deleted records.

- **Subscription.** These options determine whether the SASI registers as a Subscriber of this object type in SIF Zones. Currently, only StudentPersonal Change Events are supported in version 1.5

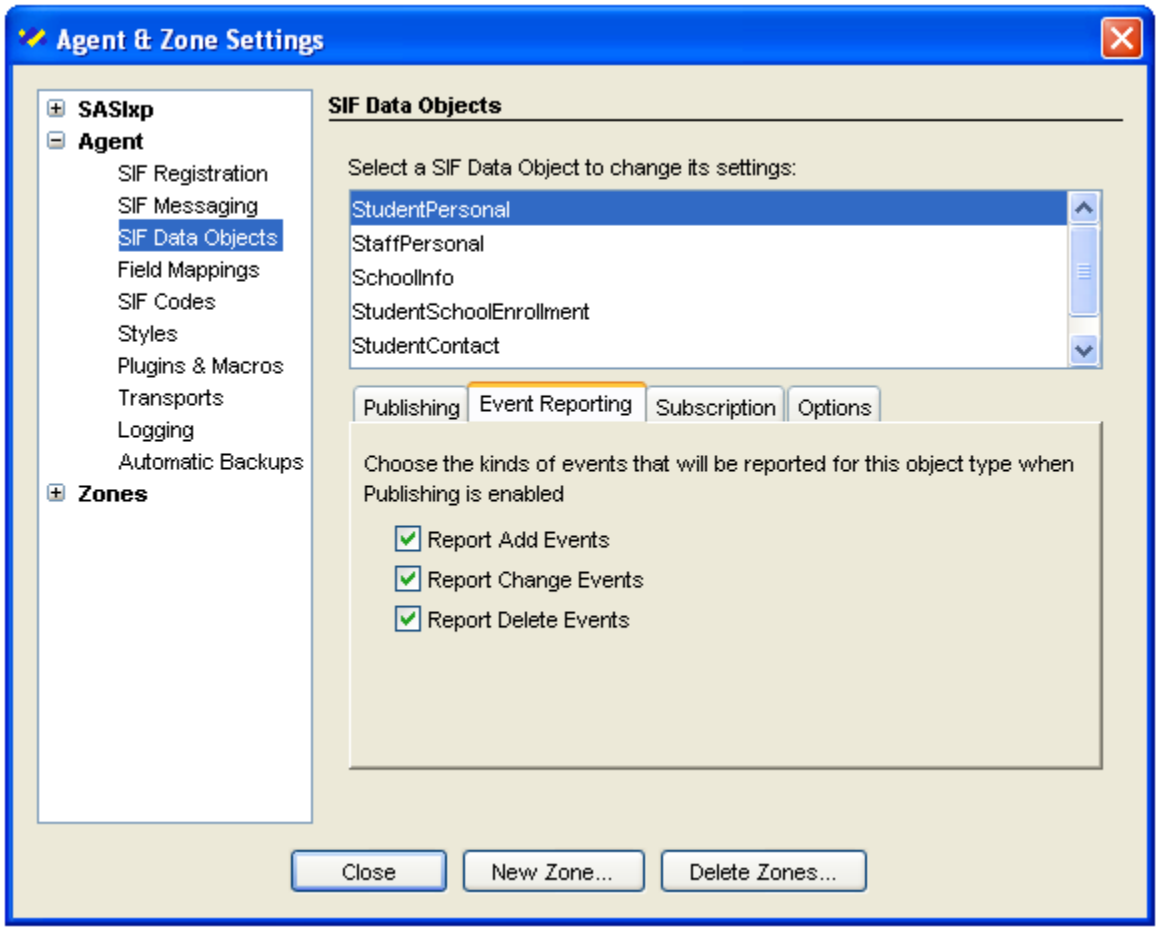
- **Options.** If additional configuration options are available, an Options tab is displayed. For example, when choosing the StudentPersonal object type you can enable dynamic address completion for empty addresses.

Publishing Tab

Check the "Provide this object type" checkbox to register as the authoritative provider of the selected SIF Data Object in each zone. While most districts will want to enable this checkbox, there are cases when another SIF Agent should be the provider of an object type. For example, you may have a third-party attendance package that is considered to be the authoritative provider of all student attendance data. In this case, use the Publishing tab to disable the SASI agent's attendance objects.

Event Reporting Tab

Check the types of SIF Events that should be reported by the agent. In general, these checkboxes should always be enabled.

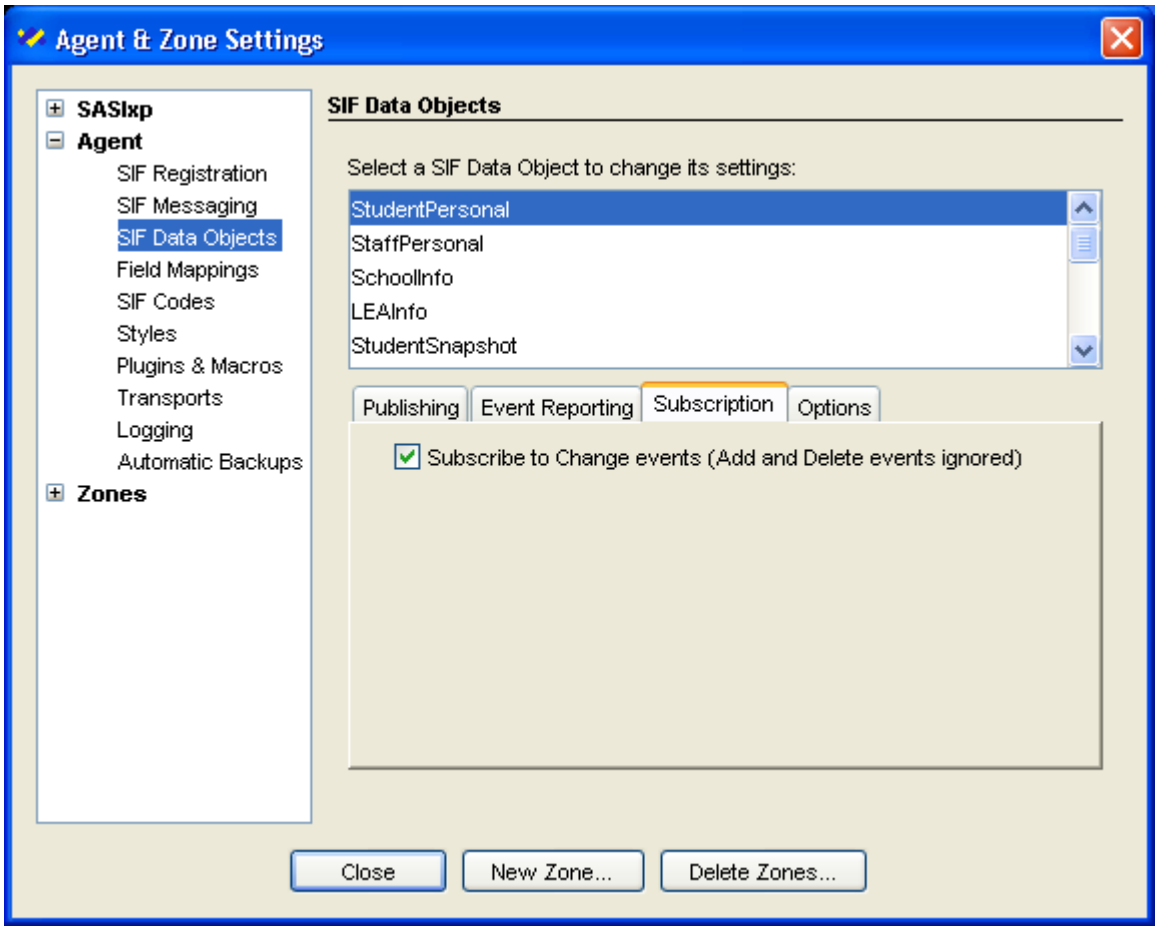


You can improve overall performance of the agent and decrease the size of the SASI Event Transaction Log file by setting these checkboxes to match the Access Control permissions at the zone integration server. For example, if the administrator has denied the SASI agent permission to report Delete events for students, disable this type of event for StudentPersonal objects. This will result in a more efficient configuration

because the agent will not attempt to report events that will be denied by the zone integration server.

Subscription Tab

The Subscription tab allows you to subscribe to StudentPersonal Change Events. To subscribe to Change events, select the "Subscribe to Change events (Add and Delete events ignored)" option. This option is disabled for the other SIF Data Objects in the SIF Data Objects field



Enabling StudentPersonal Subscriptions

To activate StudentPersonal subscriptions, you need to enable the StudentPersonal subscription. To enable StudentPersonal subscriptions, follow these steps:

1. Stop the agent if currently running.
2. Open the agent.cfg file in Notepad.
3. Search for <update-permissions> tag. If this tag does not exist, add these lines to the end of the file, just before the line that begins </agent>. (Remem-

ber to replace “ALTID1” with the correct ASTU field that was mapped to the StatePrId element above, if necessary.)

```
<update-permissions policy=”Allow”>

  <permission field=”ASTU.ALTID1” source=”District Wave”/>

</update-permissions>

<update-permissions policy=”Deny”/>
```

Note the <permission> element above grants permission only to the District Wave Agent to update the ASTU.ALTID1 field (or an alternate field you have selected for the StatePrId element)

4. Save the agent.cfg file

5. Restart the agent

By default ALTID1 is the field targeted for placing the student ID. Another field may be used such as STATEID. Since STATEID is a new filed recently available, it may not be included in the SASI agent schema. To verify if a field is available such as STATEID,

1. Open the Settings dialog box

2. Navigate to the Agent > Field Mappings pane

3. Select StudentPersonal

4. Click Add. Select dropdown for Field Name.

5. Verify if STATEID is listed as an available field name.

6. If STATEID is available, cancel out of selection. Close the agent console.

If STATEID is not available through the dropdown list

1. Stop the agent if currently running

2. Open Work directory located in the default SASI SIF agent folder. Delete zone_name.schema for all available zones. Where zone_name = the name of the school zone. There should be a zone_name for each school in district using SIF.

3. Login to each instance of SASI as an administrator. All other users must be logged out.

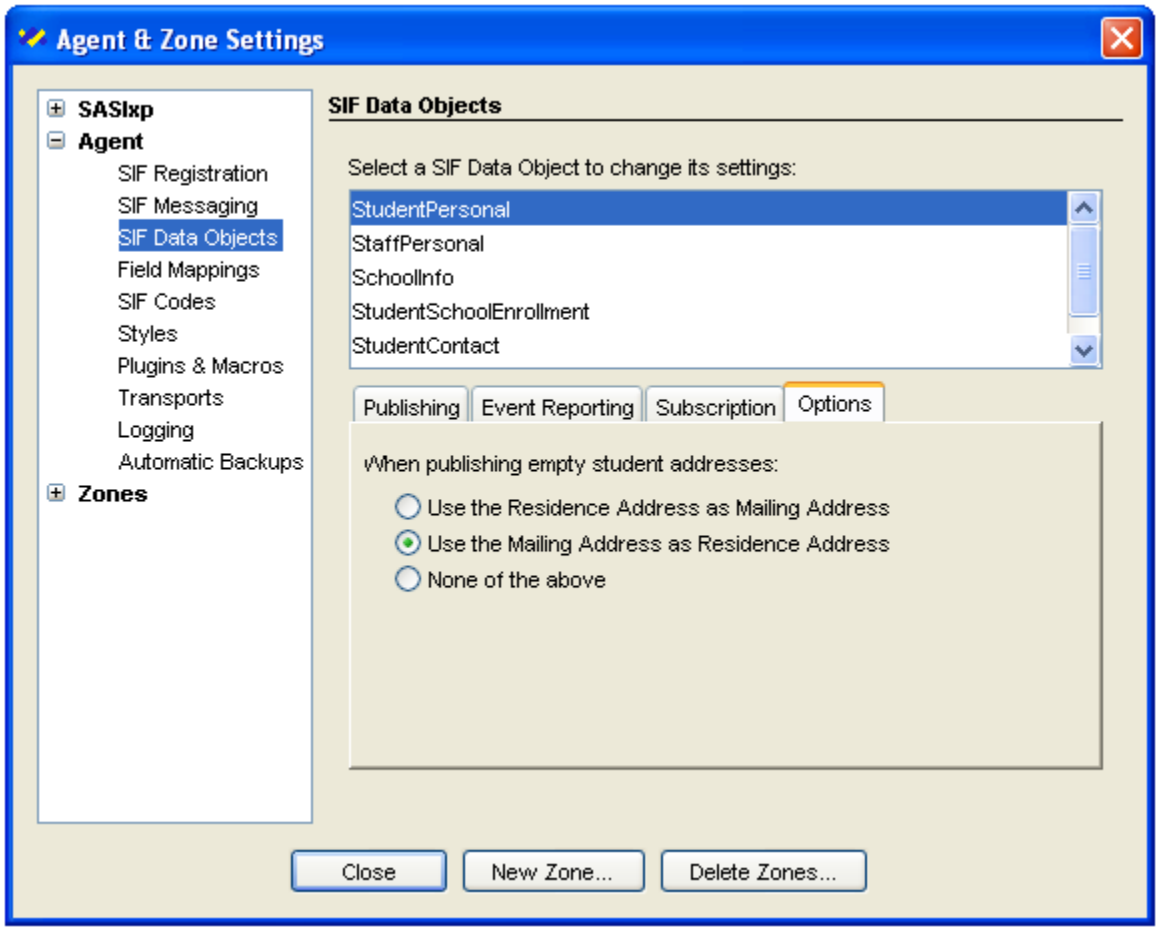
4. Launch File Def Pro atom, default location is File Maintenance folder.

5. Select menu option File Maintenance. Select Create ADF Files. Process will up-date ADF1 – ADF4 files in SASI Datafile folder.

6. When all instances of SASI have been updated, start the SASI SIF Agent. The agent will load the updated schema from the ADF files and enable the STATEID field to be accessed.

StudentPersonal Options Tab

When StudentPersonal is selected, an Options tab is displayed:



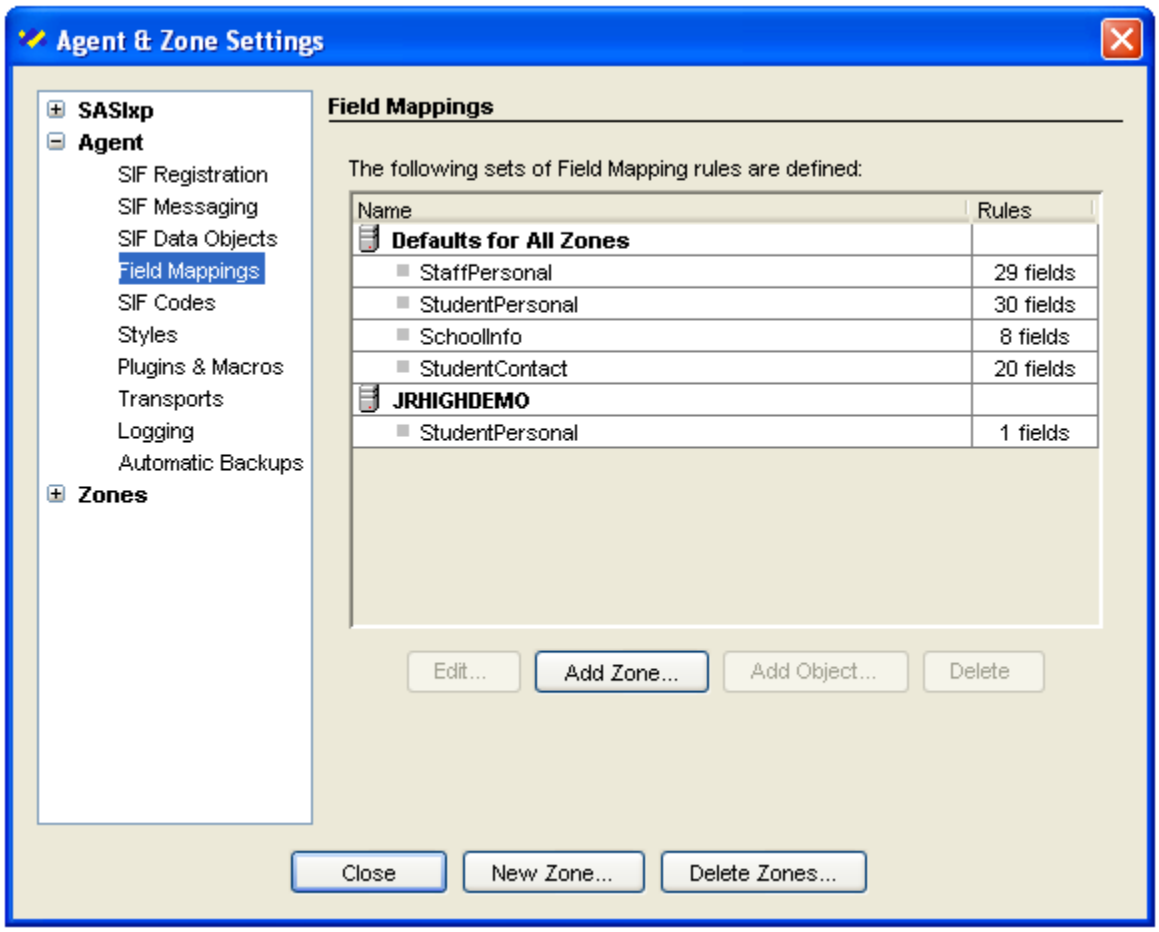
These options can be used to ensure that both a Mailing Address and a Residence Address are published for all students even when one address is blank in SASI's database. For example, most transportation systems require a Residence Address in order to properly construct each student's bus route information. However, because Mailing Address is the default for SASI, many districts to not type in both a Mailing Address *and* a Residence Address when enrolling students unless the two addresses differ. To force the agent to copy the fields of the Mailing Address into the Residence Address whenever the latter is blank, select the second radio button, "Use the Mailing Address as Residence Address".

Note these options do not modify or otherwise affect student records in the SASI database—they only influence the publishing of data by SIF. Refer to the Edustructures Technical Note available from our website for more information about using these options.

Field Mappings

One of the more powerful features of the Edustructures SIF Agent for SASI is its flexibility in customizing the way SIF Data Objects are produced from fields in the SASI database. In general, any built-in or user-defined field in a SASI database table can be *mapped* to an element or attribute in a SIF Data Object.

The agent's factory default mappings are appropriate for most installations. In some cases, however, you will need to fine-tune these mappings to publish additional fields, to change the default SIF Codes assigned to elements such as student IDs, addresses, and telephone numbers, or to adjust the mappings to accommodate a subscriber agent with rigid data-mapping requirements. Refer to the Plug-Ins & Macros section later in this chapter for additional field mappings information.



Field Mapping Rules Summary

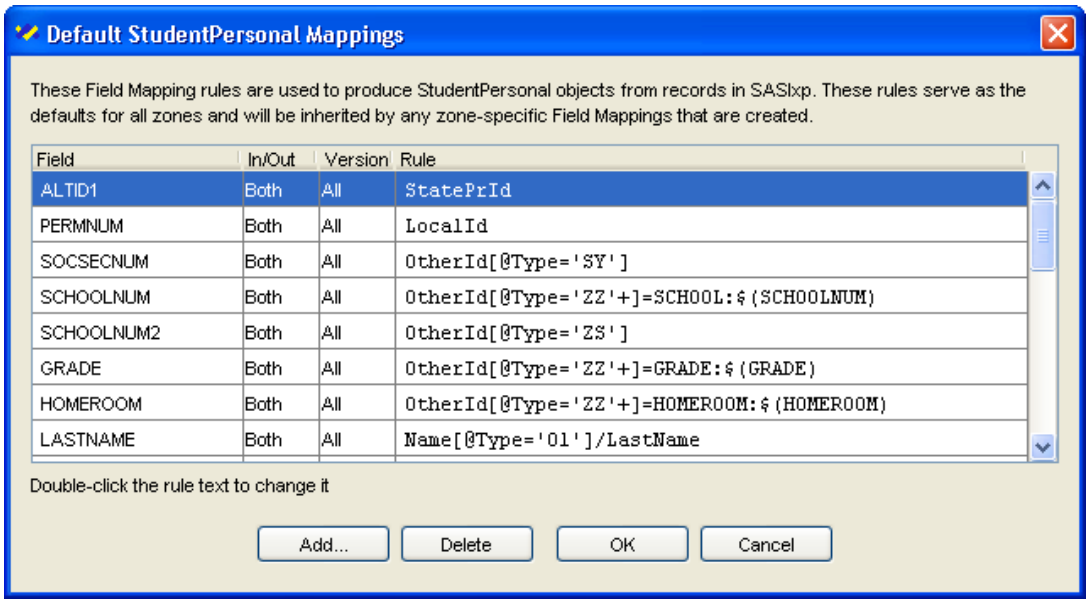
The Field Mappings panel lists each SIF Data Object supported by the agent. A few object types like StudentSchoolEnrollment cannot be customized because they are produced from calculations made by the agent instead of a one-to-one mapping with SASI data files and fields. Most SIF Data Objects, however, are customizable and will appear in the list. Defaults for all zones are shown at the top of the list, followed by zone-specific entries.

Field Mapping rules may be modified on a zone-by-zone basis. For example, it is common for elementary school zones to have slightly different mappings than high school zones. In this case, the list will include groups for each zone with indented entries for each customized SIF Data Object. (In the illustration above, one field of the StudentPersonal object has been customized in the JRHIGHDEMO zone. All other field mappings in this zone inherit from the agent defaults.)

How to Change Field Mappings for a SIF Data Object

To change the field mappings for an object,

1. Highlight the object under the "Defaults for All Zones" entry
2. Click the Edit button
3. The following dialog box appears:

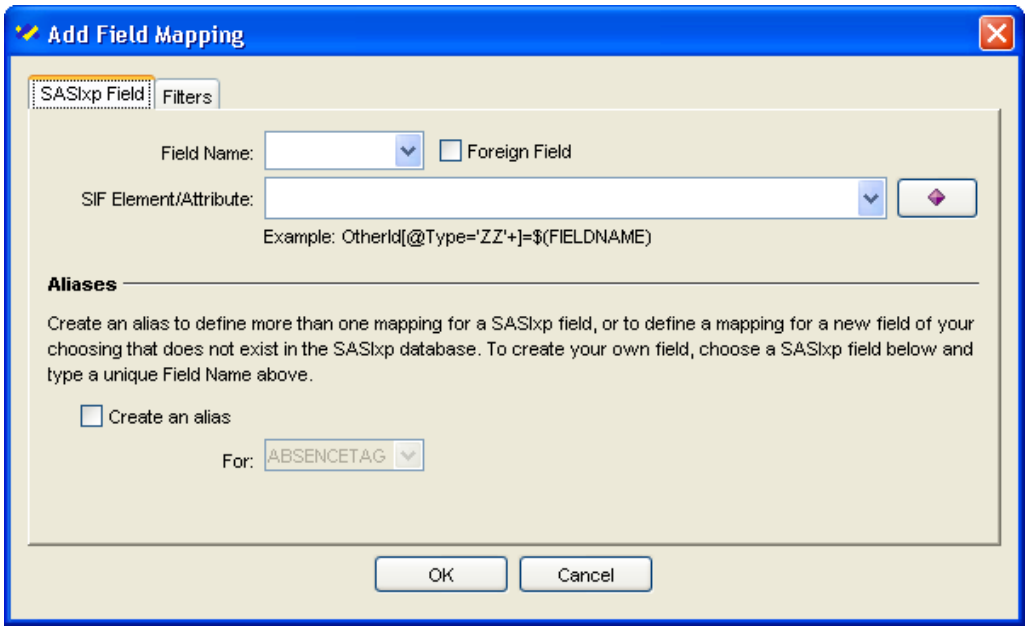


This dialog box lists all field mapping rules for the selected object type. The "Field" column shows the name of a SASI data field, and the "Rule" column shows the corresponding rule for producing a SIF element or attribute. The SASI agent uses rule syntax similar to XPath to describe how to create a SIF element or attribute.

To add a new rule,

1. Click the Add button

2. The following dialog box appears:



3. Choose an available field from the "Field Name" combo-box.

   Note: If you're mapping more than one SIF element or attribute to the same SASI field, you will need to type in a field name of your choosing that is unique. Each field must have a unique name.

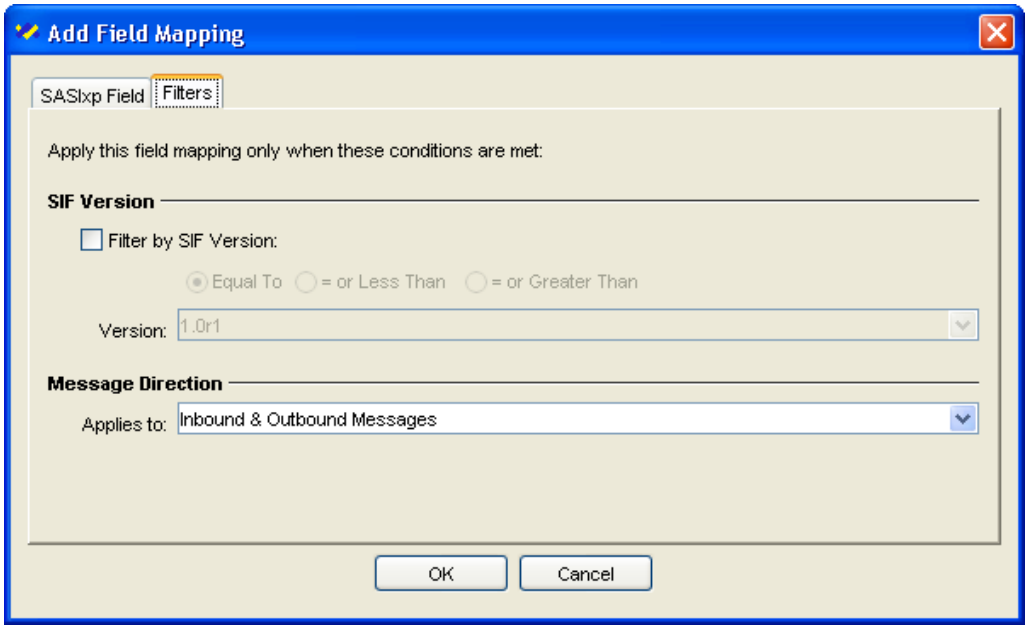
4. Type the mapping rule in the "SIF Element/Attribute" field.

   ▸ TIP: To model your entry after an existing one, click the combo-box arrow and choose an existing entry from the menu. To view the macros that can be used in your mapping rule, click the button with the purple diamond.

5. If you're mapping more than one SIF element or attribute to the same SASI field, enable the "Create an Alias" checkbox and choose the actual SASI field to which this field is mapped. Otherwise, leave this checkbox cleared.

6. Click the "Filters" tab.

7. The following dialog appears:



8. Click the "Filter by SIF Version" to activate the filter.

    a. Click the condition radio button (that is, Equal To, = or Less Than, or = or Greater Than)

    b. Select the version from the Version dropdown menu.

9. Select the message direction from the "Applies to:" dropdown menu.

10. Click OK to add the new rule to the SIF Data Object

The above example instructs the SASI agent to produce the following element for StaffPersonal objects, using the value of the `ATCH.ALTNUMBER` database field as the element's value:

```
<OtherId Type='04'>Value of ATCH.ALTNUMBER</OtherId>
```

How to Customize Field Mappings for a Zone

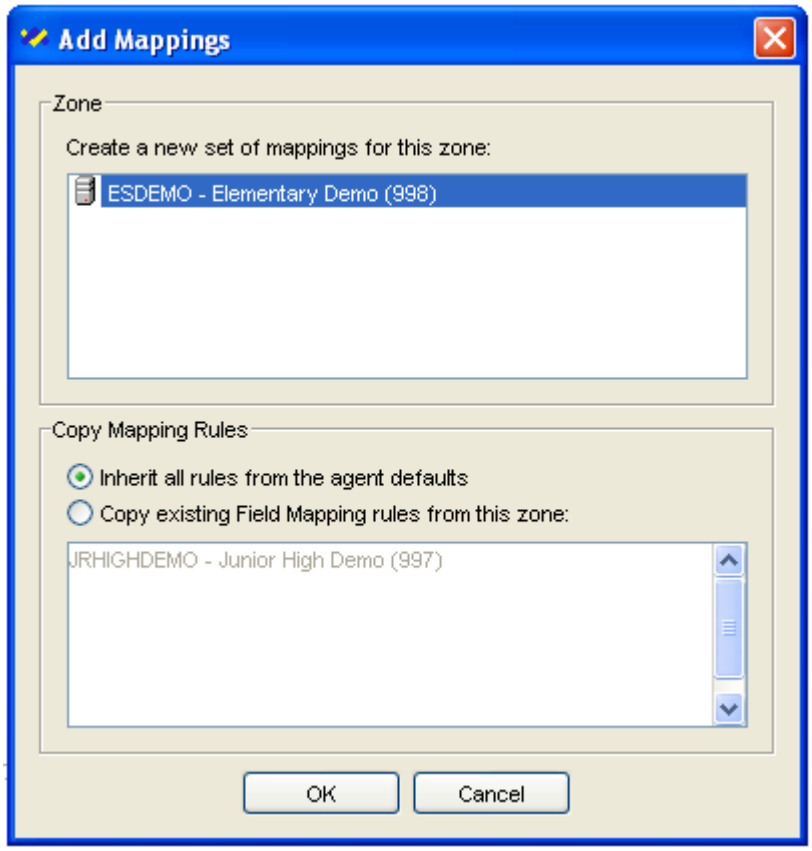
When the SASI agent produces a SIF Data Object during Event Reporting or Publishing operations, it first applies any field mapping rules that have been customized for the associated zone. Next, it applies the agent's defaults mapping rules. Thus, you can add new field mappings or "override" one or more of the defaults on a zone-by-zone basis to meet integration requirements that differ from school to school.

For example, in an elementary school zone you might publish the student "advisor" or "counselor" field to a StudentPersonal "OtherId" element, but in a high school zone publish the name of the first period teacher. Since determining the first period teacher of a student requires access to Scheduling-related data files, increasing the amount of time it takes to process each record, the high schools' mapping rules would not be appropriate as agent defaults. They would only be customized for zones representing high schools.

Follow these steps to add a zone-specific field mapping or to "override" a default mapping in a specific zone:

1. From the Field Mappings panel, click the Add Zone button

2. The following dialog box appears



3. Choose the zone to customize from the "Zone" group at the top of the dialog box.

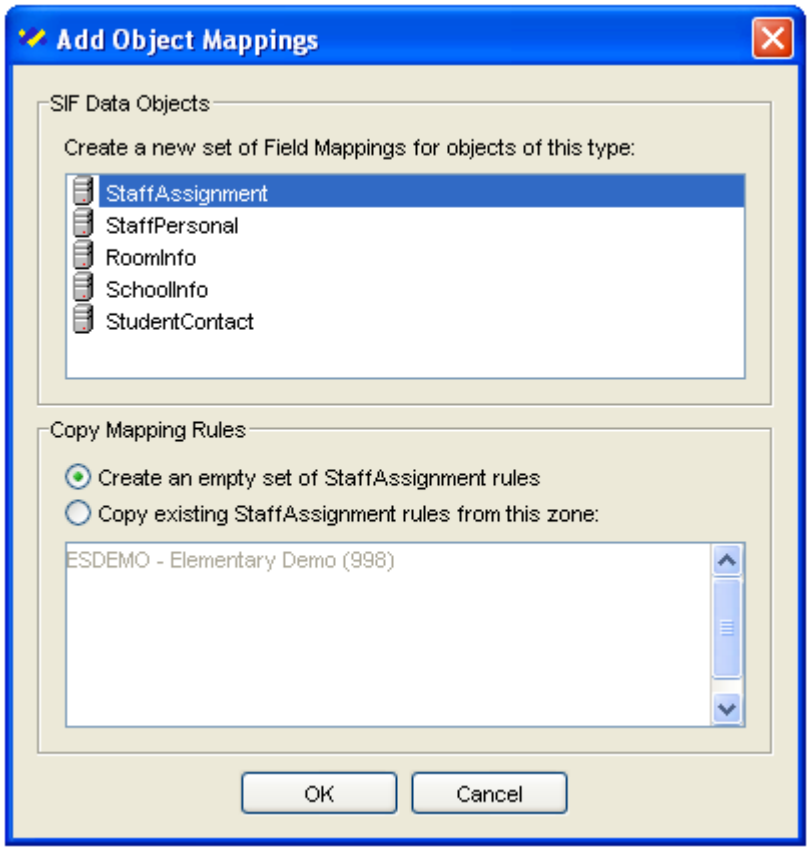
4. To copy mapping rules from another zone, click the "Copy existing Field Mapping rules from this zone" radio button and choose a zone. This option saves time and ensures consistency when creating mapping rules for a group of like zones.

5. Click the OK button to create the new zone group in the Field Mappings panel

To add field mappings for additional SIF Data Objects to your new zone group,

1. Select the new zone group in the Field Mappings panel and click the Add Object button

2. The following dialog box appears:



3. Choose a SIF Data Object from the list

You can now edit the individual field mapping rules for the selected object type as described earlier in this section.

SIF Codes

The Schools Interoperability Framework standard defines a consistent set of codes that are used for fields such as Grade Level, Ethnicity, Language, and English Proficiency. Each application must translate its own application-defined codes to these SIF-defined codes so that all agents participating in a zone agree on a common set of values. The **SIF Codes** group of settings allows you to customize the SASI-to-SIF translation tables that are used by the agent when it publishes data to a zone.

The original SIF specification used codes from the SPEEDE/ExPRESS standard, while SIF 1.1 and later prefers NCES codes. In SIF 1.5, both standards are accepted. Refer to the SIF Specification (available from the www.sifinfo.org website) for a complete list. The factory defaults reflect the SPEEDE standard to enable the agent to more easily interoperate with older SIF 1.0r1 zones, although you can change the SASI agent to use either set of codes.

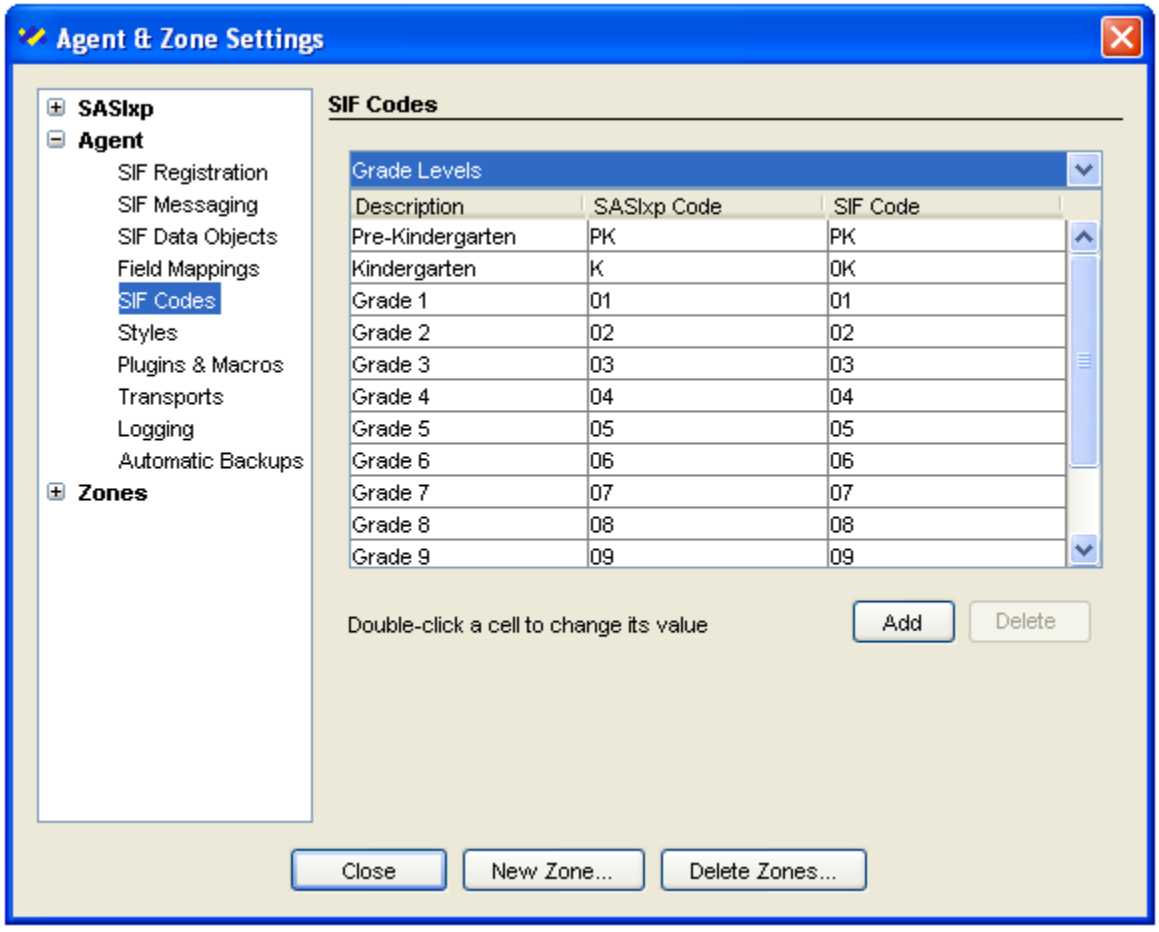
Before connecting the agent to the zone integration server, it is a good idea to verify that the factory default codes are appropriate for your district. Since codes such as Grade Level and Ethnicity are customizable in SASI, it is usually necessary to configure the agent's SIF Codes to reflect the specific SASI values used at your district. For example, if your district uses "K" to represent the Kindergarten grade instead of the factory default of "00", the Grade Levels table must be changed to reflect this.

Grade Levels

To edit the Grade Levels table,

1. Click the **SIF Codes** node in the tree

2. Choose "Grade Levels" from the combo-box at the top of the page



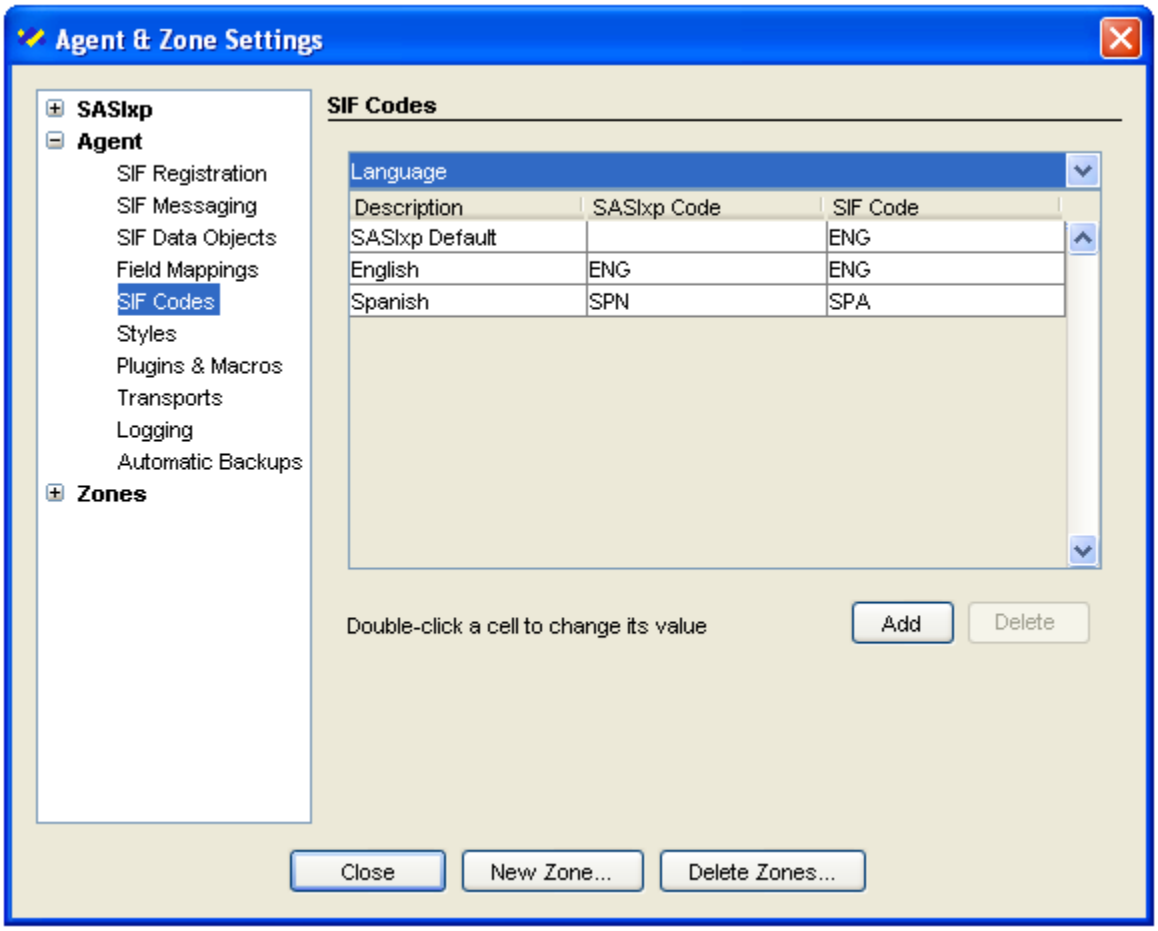
3. Double-click any value in the SASI Code column to change a grade level to match the values used at your district

Language

To edit the Language table,

1. Click the **SIF Codes** node in the tree

2. Choose “Language” from the combo-box at the top of the page



3. Double-click any value in the SASI Code column to change a language code to match the values used at your district

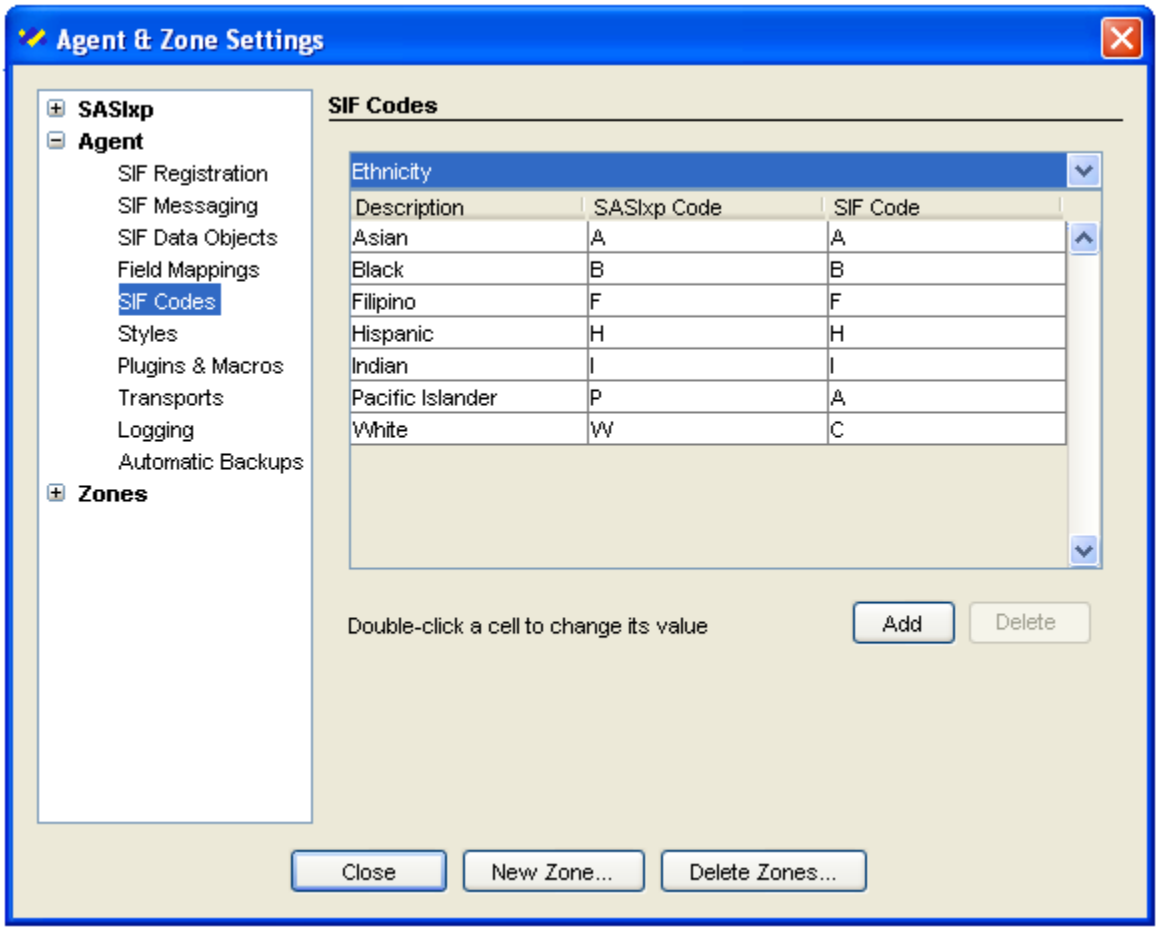
4. To add a Language, click the Add button and enter both the SASI Code and the equivalent SIF Code. The new entry is appended to the end of the list (order is not important to the functionality of the agent.) To delete a code, select it in the list and click the Delete button.

Ethnicity

To edit the Ethnicity table,

1. Click the **SIF Codes** node in the tree

2. Choose “Ethnicity” from the combo-box at the top of the page



3. Double-click any value in the SASI Code column to change an Ethnicity code to match the values used at your district

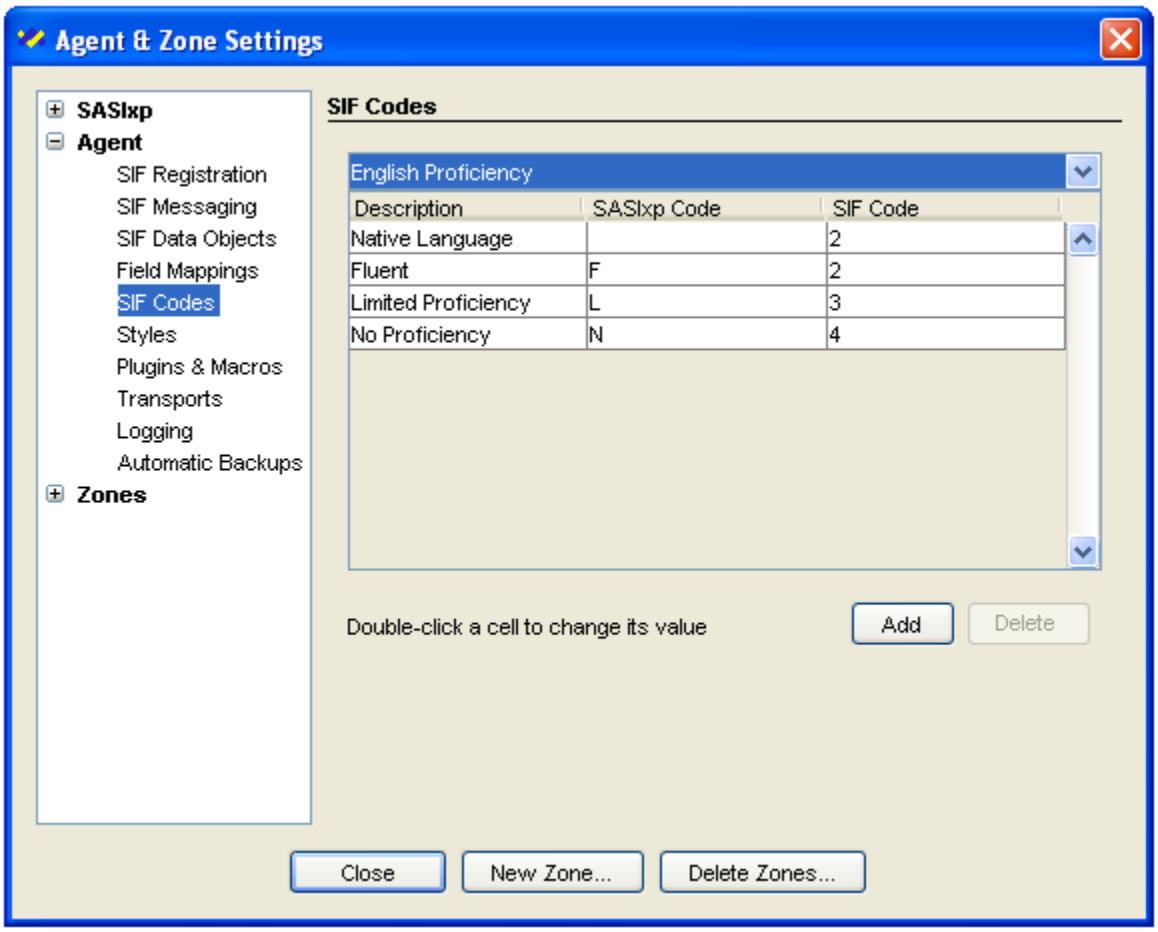
4. To add an Ethnicity code, click the Add button and enter both the SASI Code and the equivalent SIF Code. The new entry is appended to the end of the list (order is not important to the functionality of the agent.) To delete a code, select it in the list and click the Delete button.

English Proficiency

To edit the English Proficiency table,

1. Click the **SIF Codes** node in the tree

2. Choose "English Proficiency" from the combo-box at the top of the page



3. Double-click any value in the SASI Code column to change an English Proficiency code to match the values used at your district. Note that two or more SASI English Proficiency codes may translate to the same SIF Code value.

4. To add an English Proficiency code, click the Add button and enter both the SASI Code and the equivalent SIF Code. The new entry is appended to the end of the list (order is not important to the functionality of the agent.) To delete a code, select it in the list and click the Delete button.

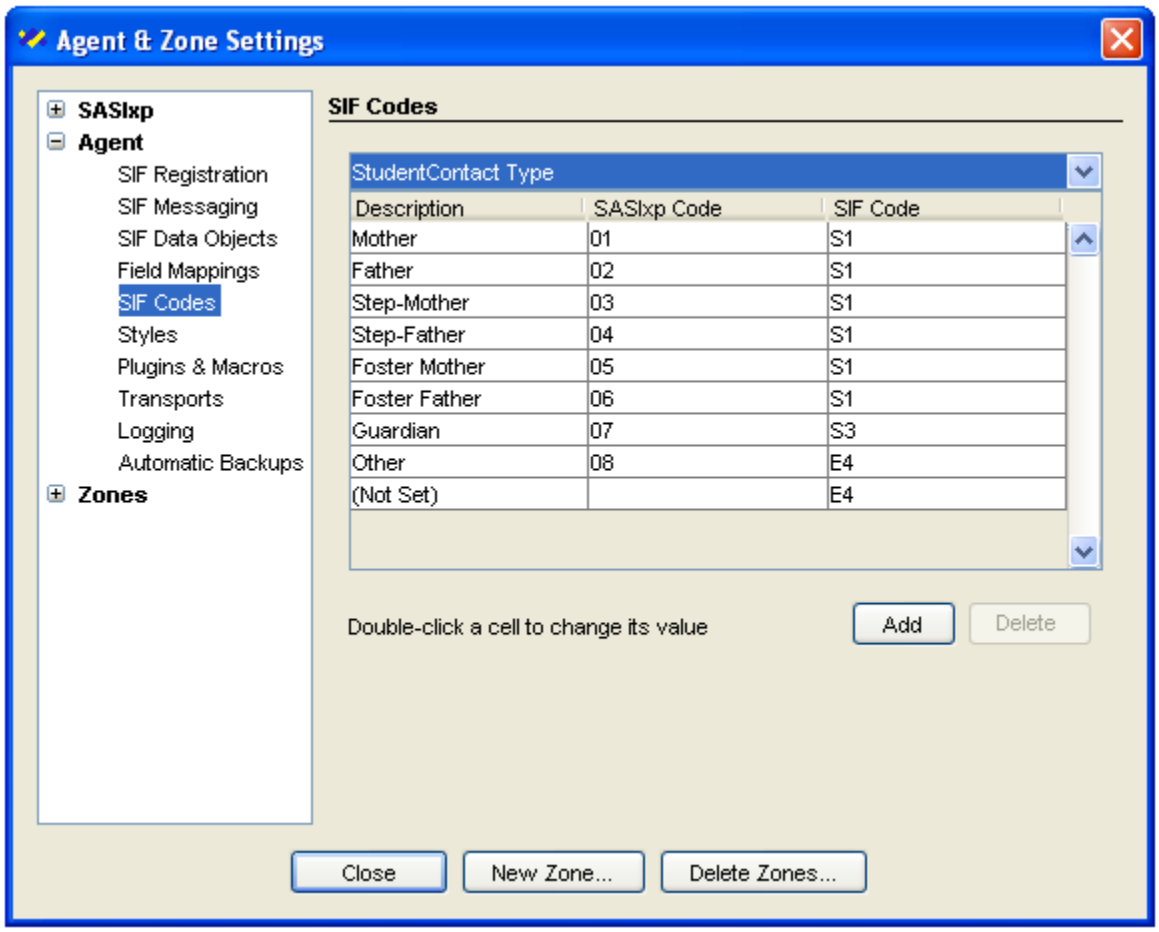
StudentContact Type and Relationship

The SIF `StudentContact` data object includes both a Type and a Relationship code field, each of which uses an independent set of codes defined by the SIF Specification. The "StudentContact Type" and "StudentContact Relationship" tables let you define how the SASI Parent/Guardian relationship code translates to these two fields.

Note that these tables may have many entries that translate to the same SIF code. For example, the SASI relationship codes for Mother, Father, Step-Mother, and Step-Father all translate to a single StudentContact Type of "S1", defined by the SIF Specification as "Parent".

1. Click the **SIF Codes** node in the tree

2. Choose “StudentContact Type” or “StudentContact Relationship” from the combo-box at the top of the page

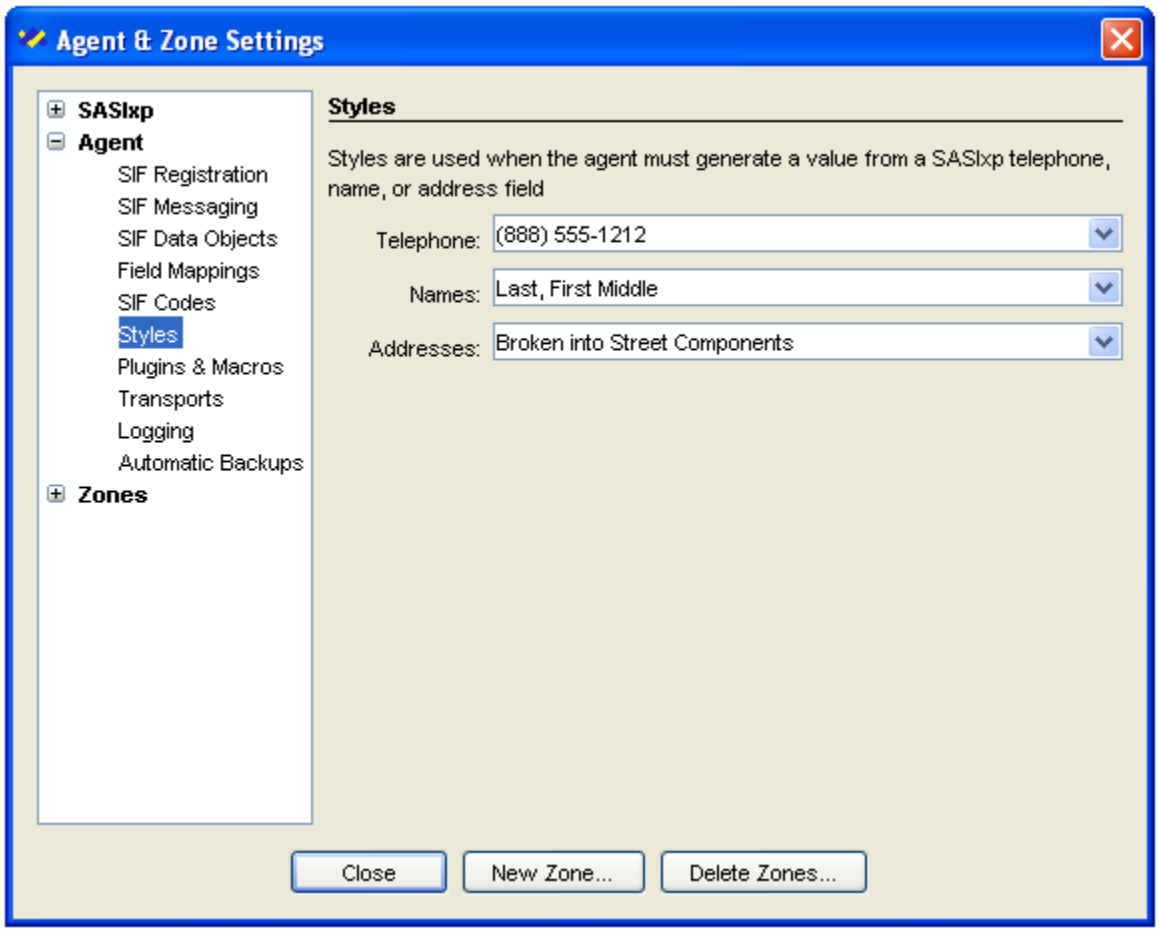


3. Double-click any value in the SASI Code column to change a language code to match the values used at your district. Note that two or more SASI English Proficiency codes may have the same SIF Code value.

4. To add a code code, click the Add button and enter both the SASI Code and the equivalent SIF Code. The new entry is appended to the end of the list (order is not important to the functionality of the agent.) To delete a code, select it in the list and click the Delete button.

Style Settings

Style settings control how the agent formats telephone numbers, person names, and addresses whenever it must produce a value of this type. For example, telephone numbers are actually stored as unformatted numbers (e.g. 8017901261 versus “801-790-1261”) in the SASI database. Whenever the agent populates a SIF telephone number field with a value from the database, it consults the Style settings to determine how to format the number as a string.



Telephone

This style defines how telephone numbers are formatted (e.g. “801-790-1261”)

Names

This style defines how person names are formatted (e.g. “Last, First M”)

Addresses

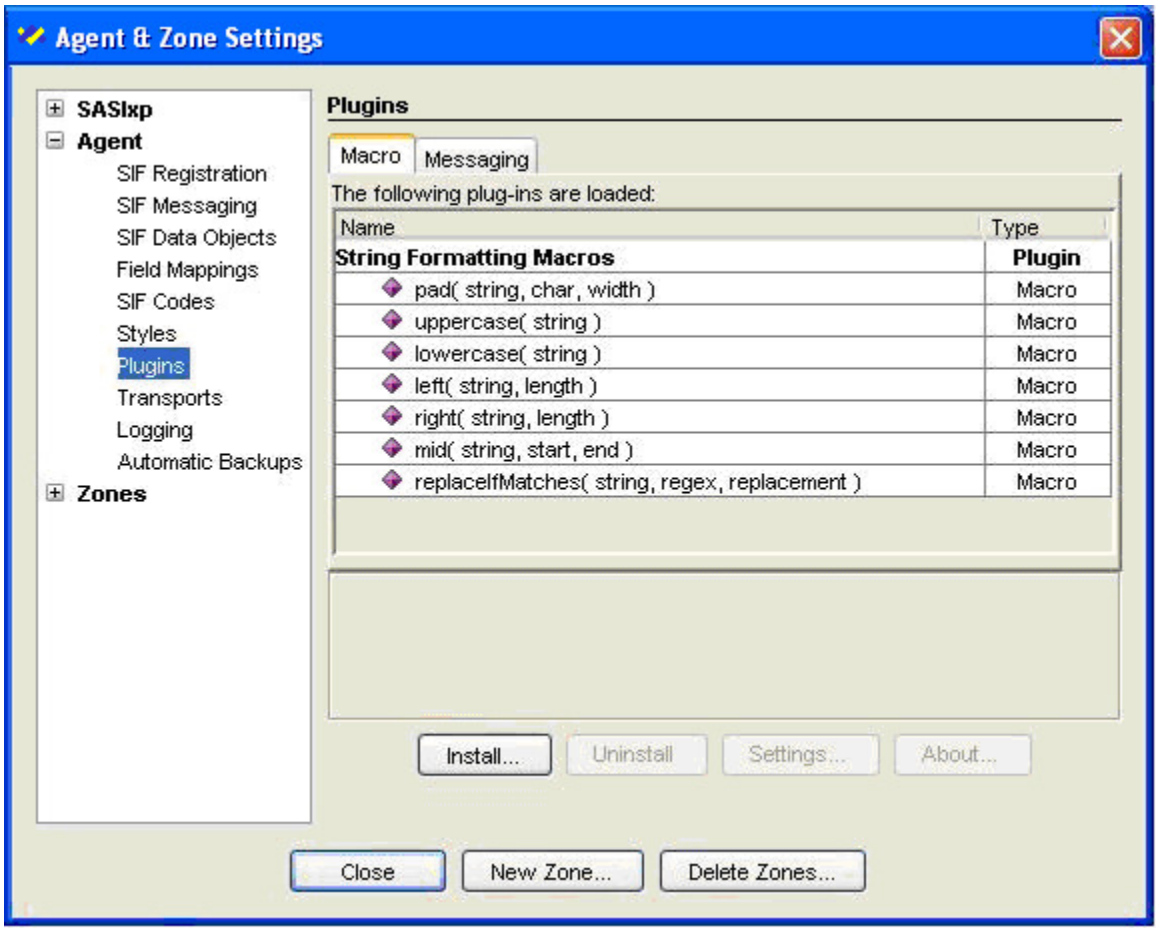
This style indicates whether addresses should be published as they’re stored in the SASI database (i.e. as simple strings), or broken into individual address elements. The latter is most useful for integration with transportation systems that recognize the individual components of an address (i.e. direction, street number, street name, apartment or building number, and so on.)

Plug-Ins & Macros

The Plug-Ins & Macros panel shows the various *plug-in modules* that are loaded by the SASI agent, and the *macros* contained in each. Use this panel to install and uninstall plug-ins modules from Edustructures and third-party companies. The agent includes several plug-ins, some of which are installed by default and others that must be manually installed as needed.

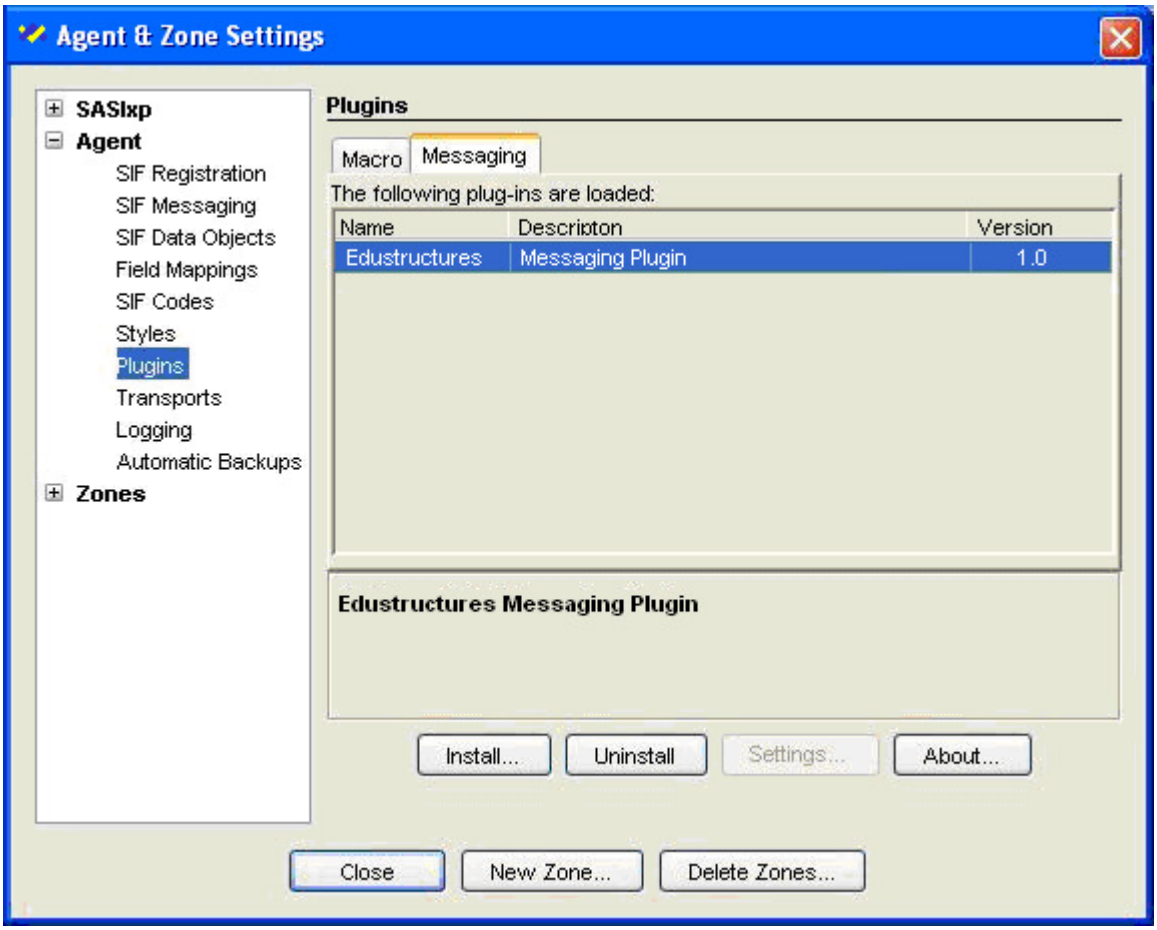
Macro

Macros are used in field mappings to perform calculations and cross-table database lookups when the agent converts field data from SASI to SIF Data Object form.



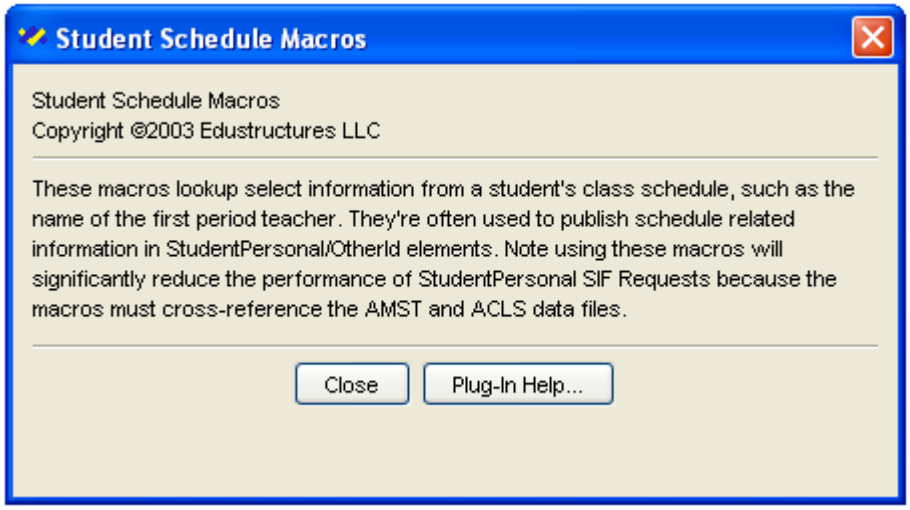
Messaging

Messaging Plugins are used to support unique client needs for individual SIS configurations. These plug-ins support SRC (State Reporting Code) modules and meet data collection requirements. To install a plug-in, click **Install** and follow the prompts.



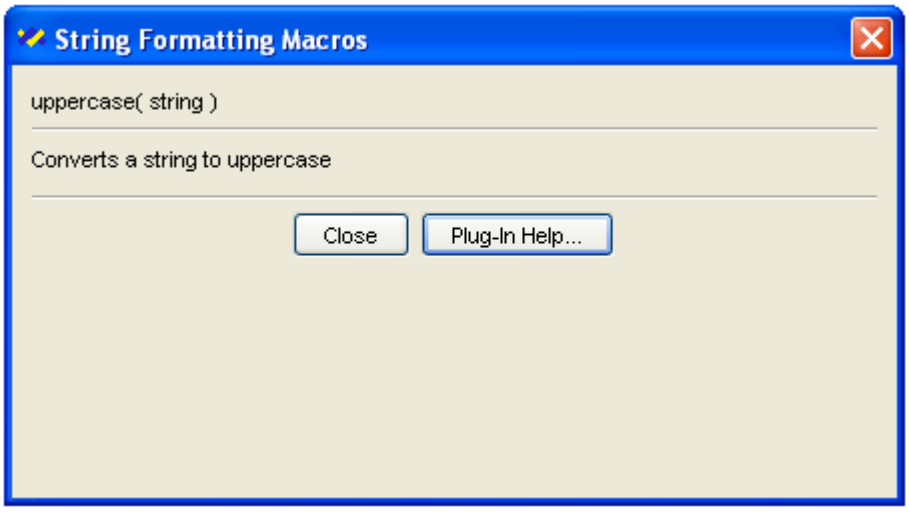
Reviewing Loaded Plug-Ins & Macros

The Plug-Ins & Macros page displays all plug-in modules that are currently loaded. A description of the highlighted entry is displayed beneath the table. You can also click the About button to open a dialog box with more information.



For plug-in modules, the About dialog box shows the name of the plug-in, the author's copyright notice, and a brief description of the plug-in module's contents. Some plug-ins provide additional documentation and help pages on the web. If available, the Plug-In Help button if visible.

For macros, the About dialog box shows the syntax of the macro (i.e. the number of parameters and the name of each) as well as a brief description of the macro's purpose:

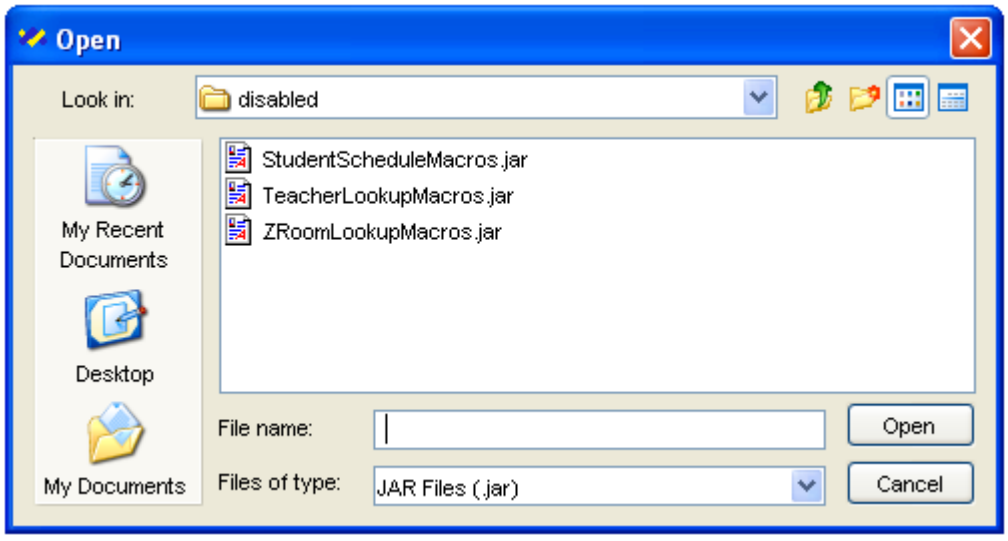


Installing a Plug-In Module

Follow these steps to install a plug-in module:

1. Click the Install… button

2. Choose a plug-in file from the agent's "/plugins/disabled" directory. If you downloaded a plug-in from Edustructures or a third-party company, use the dialog box to navigate to the plug-in's JAR file.



▸ IMPORTANT: Some plug-in modules are dependent on others in order to work properly. For example, the Room Lookup Macros require that the Teacher Lookup Macros also be installed (although the reverse is not true). This dependency is documented in the About dialog box that's displayed for the Room Lookup Macros plug-in.

In addition, some macros cache information from SASI for each zone the agent is connected to and therefore increase the amount of time it takes for the agent to start up. For this reason, it is recommended that you only install those plug-in modules that you're making use of in Field Mappings. Performance considerations are usually documented in the plug-in module's About dialog box.

After installing a plug-in, review the About dialog box to make sure you understand any performance implications and/or dependencies the plug-in has on other modules.

Uninstalling a Plug-In Module

To remove a plug-in module,

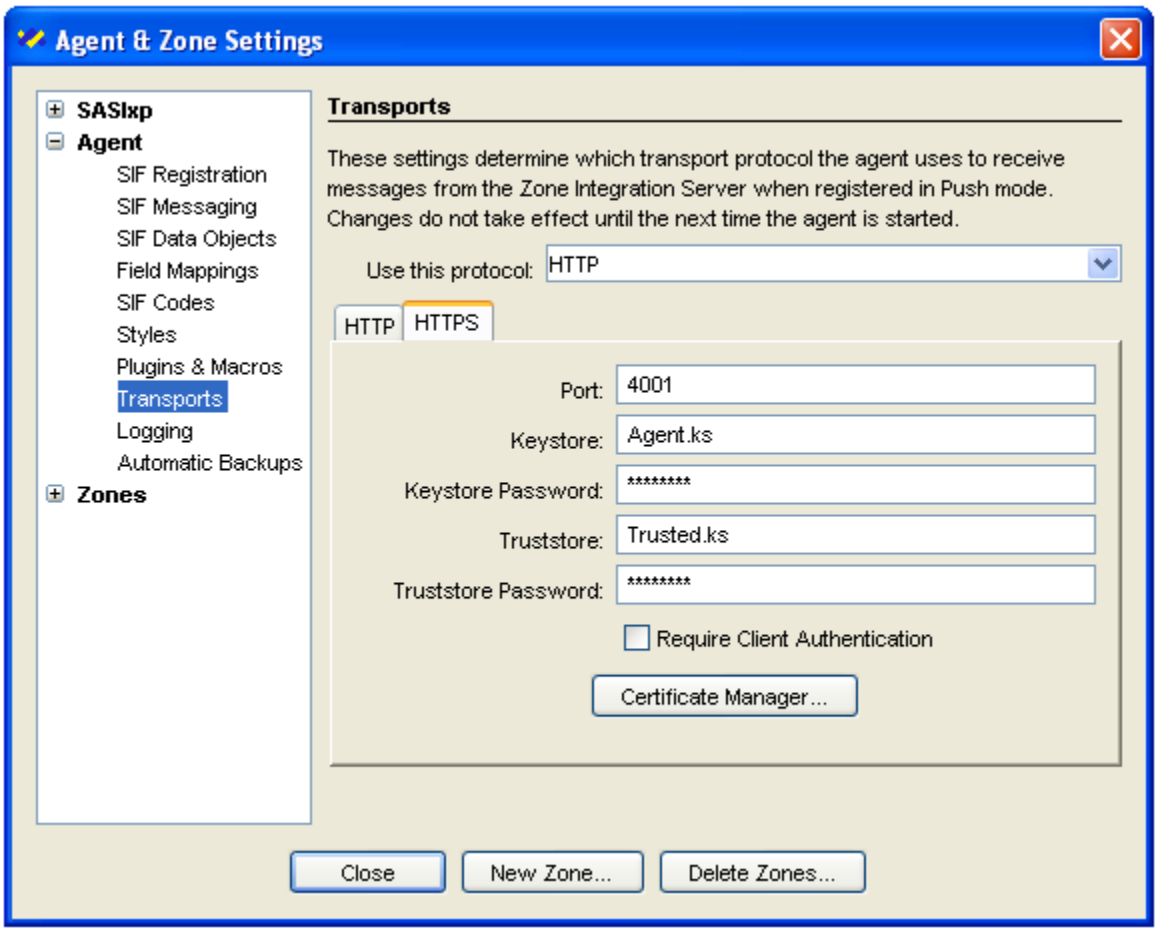
1. Select the plug-in from the list

2. Click the Uninstall button

The plug-in module is unloaded and its JAR file is moved from the agent's "/plugins" directory to the "/plugins/disabled" directory.

Transport Settings

The Transports group of settings controls how the agent communicates with the zone integration server over the HTTP or HTTPS transport protocols. Refer to the Security section in the Advanced Configuration chapter for additional information on configuring HTTPS.



Protocol

Choose the networking protocol used to communicate with the zone integration server when the agent is running in Push mode. (In Pull mode, this setting is ignored.) The default is HTTP. When the agent starts up, it will establish a networking socket on the specified port to "listen" for incoming messages sent by the zone integration server.

▸ NOTE: The protocol chosen here must match the protocol used in the Zone URL field of each zone. (See Zone Configuration later in this chapter.) In other words, you cannot send messages to the ZIS over HTTPS but configure the Transports settings to receive messages over HTTP. The protocols must match.

HTTP Port

The port the agent will listen on for incoming HTTP traffic when the Protocol field is set to HTTP. The factory default is 4000. Change the port number only if another application on the computer is already using this port.

HTTPS Port

The port the agent will listen on for incoming HTTPS traffic when the Protocol field is set to HTTPS. The factory default is 4001. Change the port number only if another application on the computer is already using this port.

Require Client Authentication

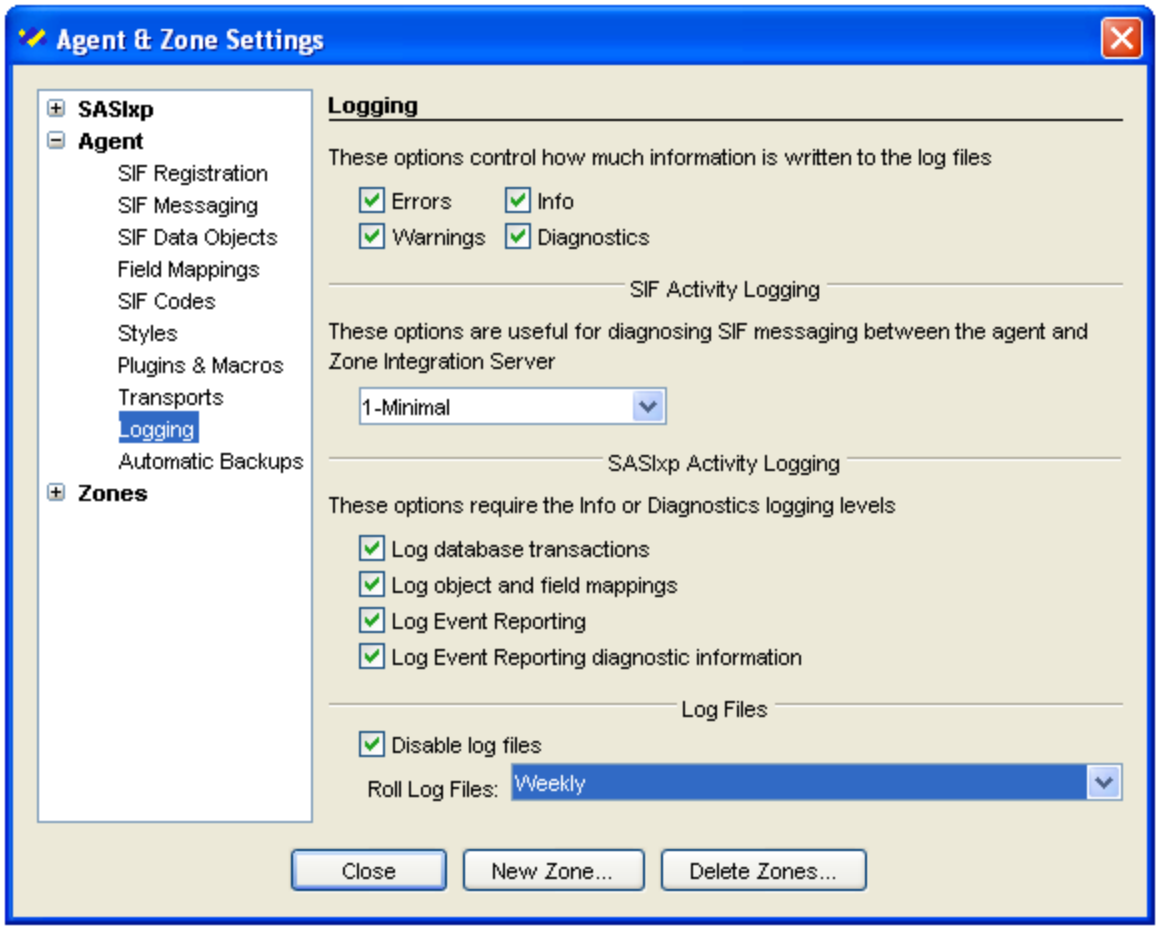
Check this checkbox if the agent should require Client Authentication from the zone integration server when it connects to a zone. In other words, the ZIS must present a valid certificate with a matching host name in order for a connection to be established.

Certificate Manager

Refer to the section of Security in the Advanced Configuration chapter for more information about managing digital certificates for HTTPS connectivity.

Logging Settings

This group of settings controls the amount of diagnostic logging information that is written to the agent and zone logs. Log files are found in the agent's "logs" subdirectory.



Errors, Warnings, Info and Diagnostics

These checkboxes control how much information is written to the log files

SIF Activity Logging

This setting controls how much if any low-level SIF Messaging activity is written to the log files, independent of any SASI-related activity. Experiment with these settings to determine how much logging is desired. For example, if you're interested in viewing the actual SIF infrastructure messages that are exchanged between the agent and zone integration server, choose the "4-Detailed" level or higher. If you're only interested in seeing the SIF message identifiers but not the actual payload of each message, decrease the logging level to "2-Moderate". To view all SIF activity logging, choose "6-All".

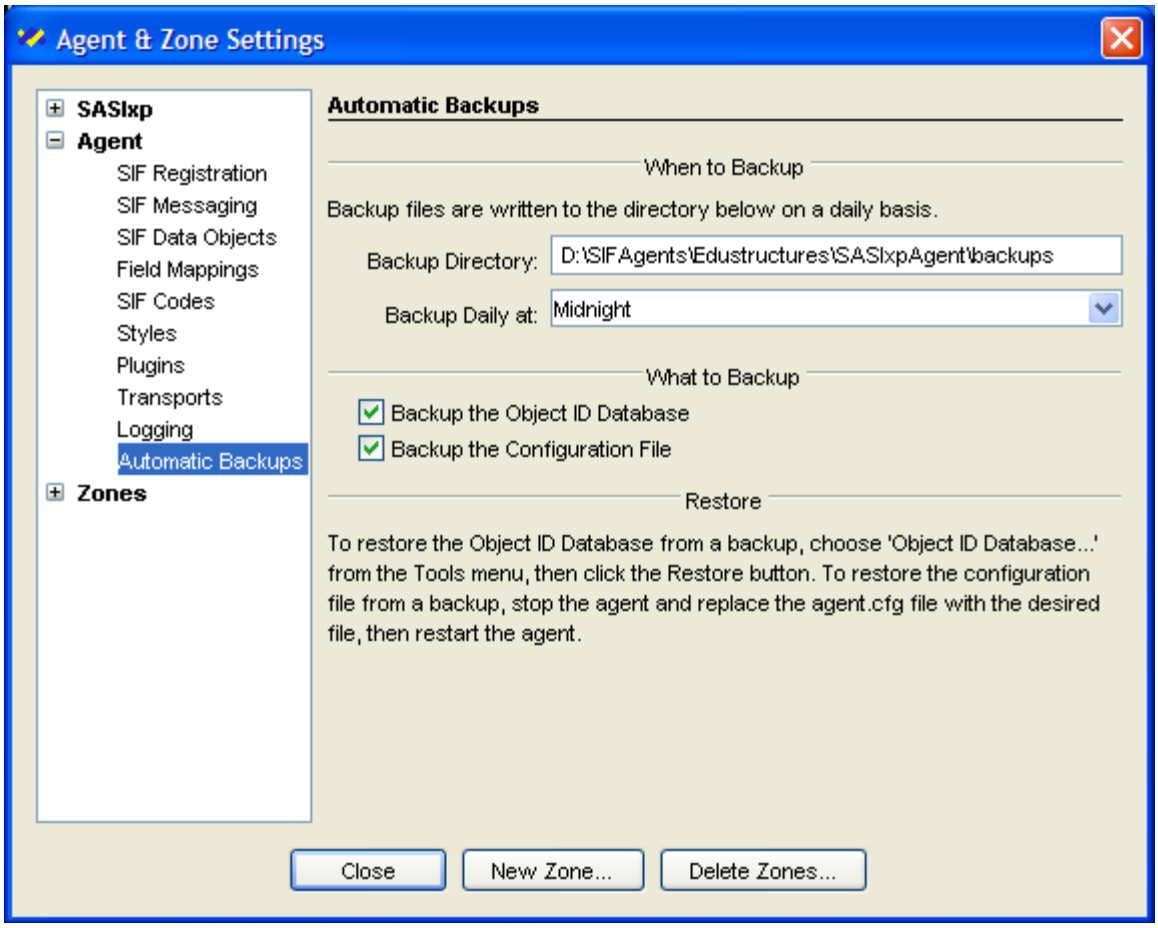
SASI Activity Logging

Use these checkboxes to choose the types of SASI-related activities that will be written to the log files. For example, to view details about each change captured in the SASI Event Transaction Log whenever the agent reports a SIF Event, check the "Log Event Reporting" and "Log Event Reporting Details" check boxes. Note the latter is considered a *diagnostic* log level so "Diagnostics" checkbox must also be checked at the top of the page.

Automatic Backup Settings

The SASI agent can perform automatic backups of both the configuration file and Object ID Database on a nightly basis. Backups are written to the agent's "backups" subdirectory at the time of day selected (by default, 10:00pm). The name of the backup file is numbered 1-7 to reflect the seven days of the week.

By turning on Automatic Backup and including the "backups" directory in your district's regular tape backup plan, you can ensure that both the agent configuration file and Object ID Database are backed up on a nightly basis. Should it become necessary to restore the Object ID Database from a tape backup, use the Restore button on the Object ID Database dialog box available from the Tools menu as described on page 74.


Agent & Zone Settings
SASIxp
Agent
SIF Registration
SIF Messaging
SIF Data Objects
Field Mappings
SIF Codes
Styles
Plugins
Transports
Logging
Automatic Backups
Zones
Automatic Backups
When to Backup
Backup files are written to the directory below on a daily basis.
Backup Directory:
D:\SIFAgents\Edustructures\SASIxpAgent\backups
Backup Daily at:
Midnight
What to Backup
Backup the Object ID Database
Backup the Configuration File
Restore
To restore the Object ID Database from a backup, choose 'Object ID Database...' from the Tools menu, then click the Restore button. To restore the configuration file from a backup, stop the agent and replace the agent.cfg file with the desired file, then restart the agent.
Close
New Zone...
Delete Zones...

6. Zone Configuration

The final step in the configuration of the SASI agent is to define the SIF Zones to which it will connect.

SIF Zones Overview

The Schools Interoperability Framework features a scalable architecture in which applications and their data are organized into "zones". Each SIF Zone is managed by a zone integration server. When two or more agents register in a zone, they're able to communicate with one another by exchanging messages with the server.

SASI School Zones

The data that flows through a zone is defined by the agents that publish data—in the case of SASI, the set of records published to each zone comes from a single school. This is because the SASI agent employs a "one school per zone" model in which data from each school is published to a zone specifically created for that school (versus publishing the data from all schools in the district to a single, monolithic zone.) This one-school-per-zone approach is the most scalable, flexible method of deploying the Schools Interoperability Framework.

Aggregate Zones

In some cases it is necessary to group two or more schools into a single zone. For example, a State Department or a Regional Service Agency may wish to connect to your SIF infrastructure in order to query SIF Data Objects for the purpose of vertical reporting. It would be cumbersome for this kind of application to connect to each school zone individually, especially in a large district. What's needed is a way for the district administrator to create a single, monolithic zone that represents all schools in the district. This way, the State Department can connect to one zone instead of tens or hundreds of school zones.

With the SASI agent, you can create "aggregate zones" that serve to aggregate the data from two or more school zones. Aggregate zones function as a single point of communication for many school zones. When a SIF Request is received, it is dispatched to all of the school zones that are members of the Aggregate Zone; the results are combined into a single response and returned to the requesting agent. Similarly, when events are reported by a SASI school, they're also reported to any Aggregate Zones of which the school is a member.

Creating School Zones

SIF Zones are defined and managed by a Zone Integration Server, not by the SASI agent. Before you can configure the agent to connect to a zone, that zone must first be created and configured at the SIFWorks® Zone Integration Server.

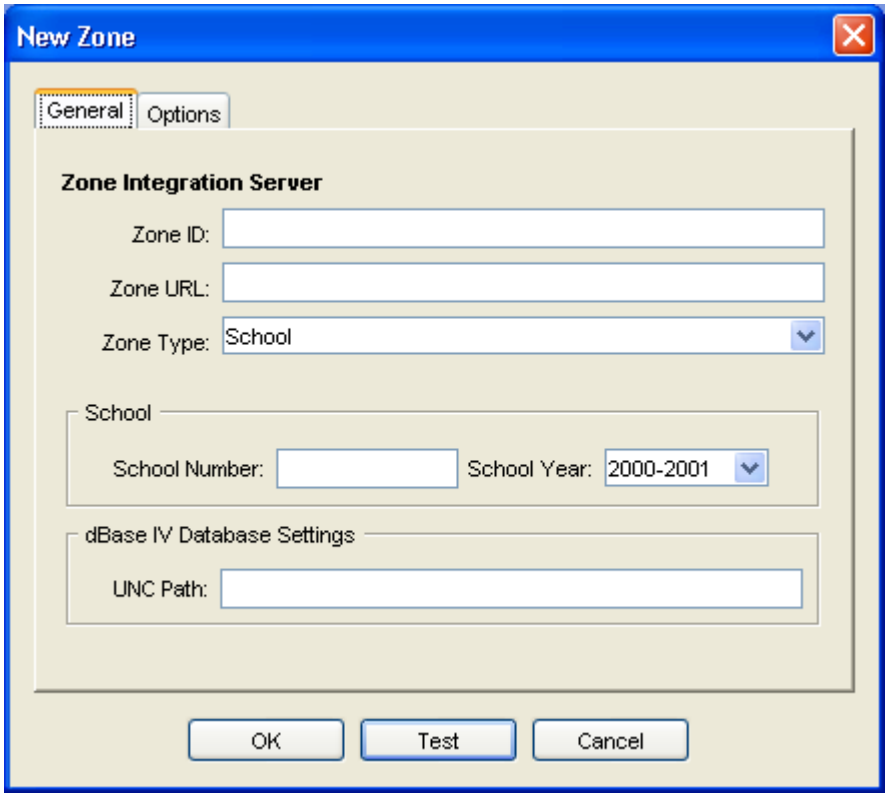
Before proceeding, gather the following information:

- The IP address or hostname of the SIFWorks ZIS

- The protocol used by the SIFWorks ZIS (e.g. HTTP or HTTPS)
- The port number of the SIFWorks ZIS (7080 is the default)
- The Zone ID (e.g. "CLEMENTS_MS")

Next, follow these steps to define each school zone to which the agent will connect:

1. Start the agent if not already running
2. Click on the SIF logo on the system tray to open the Console
3. Click the **New Zone…** button
4. The New Zone dialog box will appear:



5. Fill in the Zone Integration Server fields:

Field	Description
Zone ID	The ID of the zone. This value is case-sensitive and must precisely match the zone ID on the zone integration server that manages this zone
Zone URL	The URL to connect to the zone integration server that manages this zone. When connecting to SIFWorks®, the format of the URL is: "http://hostname:port/ZoneID". Note the ZoneID is case sensitive and must be entered exactly as it appears in the SIFWorks ZIS Console.
Zone Type	Choose "School Zone" to create a zone that maps to a SASixp

	school. Once you've created two or more school zones, you can choose "Aggregate Zone" to create a special type of zone that serves to aggregates schools zones into a single SIF Zone. Aggregate zones are discussed in greater detail in Part III of this guide.

6. Fill in the school number and school year fields

Field	Description
School Number	The SASI school number (e.g. "301")
School Year	The SASI school year (e.g. "2002-2003")

7. Fill in the database settings.

   dBASE IV Users: Enter the UNC path that points to the desired zone in the SASI folder. If you do not know the path or do not have appropriate permissions to the SASI folder, contact your System Administrator.

   Oracle and SQL Server Users: If you're using Oracle or SQL Server, school zones typically connect to a single, centralized database instead of multiple databases. The configuration parameters for this database was specified earlier in the SASI Options pane of the Settings dialog box (see page 21). If you want to change the database settings for a specific zone, click the Details button and clear the "Use defaults" checkbox.

8. Click the Test button to test that the zone, school, and database properties are correct. If the agent is able to successfully connect to both the SASI database for this school and the Zone Integration Server, a message box will be displayed showing the name of the school. If an error occurs during the test, a message box is displayed with detailed error information.

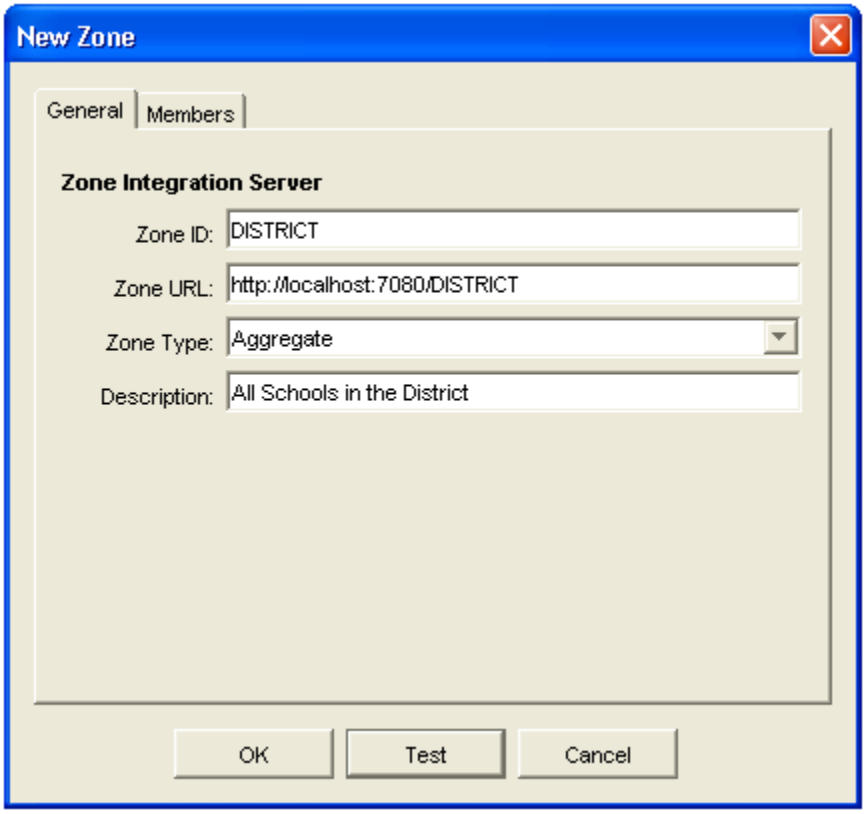
9. Click OK to save your changes. The new zone is added to the Zones tree in the Agent & Zone Settings dialog box and is also added to the main window of the Console.

Repeat these steps for each SASI school zone.

Creating Aggregate Zones

Follow these steps to create an Aggregate Zone:

1. Start the agent if not already running
2. Click on the SIF logo on the system tray to open the Console
3. Click the **New Zone…** button
4. The New Zone dialog box will appear
5. Change the Zone Type field to "Aggregate Zone" and the New Zone dialog box displays different fields as shown below:

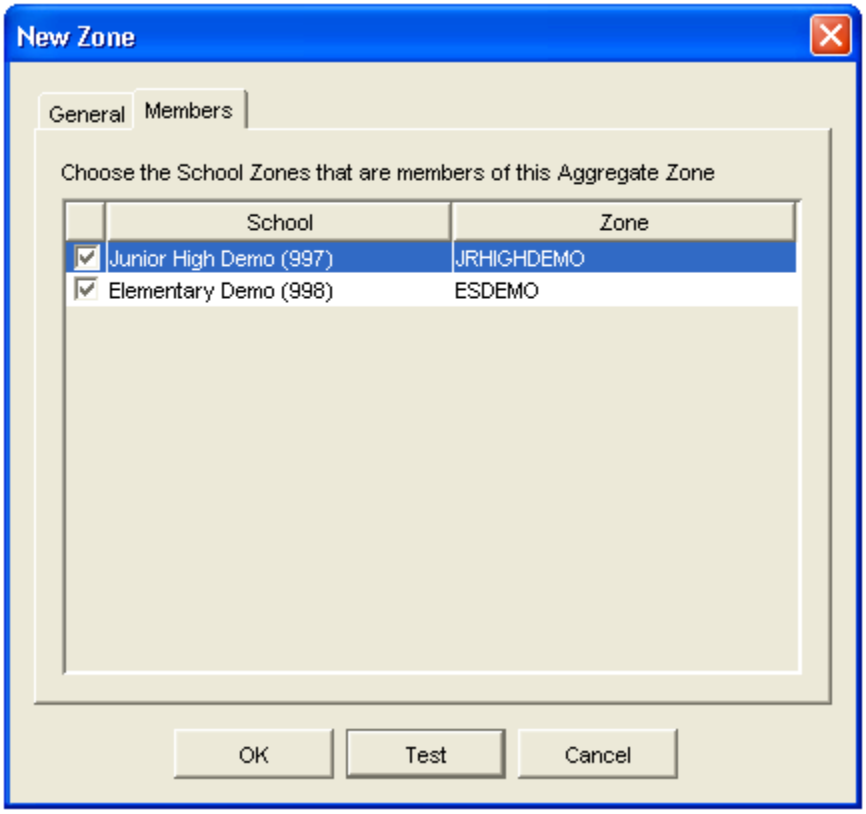


6. Fill in the Zone ID and Zone URL fields

Field	Description
Zone ID	The ID of the zone. This value is case-sensitive and must precisely match the zone ID on the zone integration server that manages this zone
Zone URL	The URL to connect to the zone integration server that manages this zone. When connecting to SIFWorks®, the format of the URL is: "http://hostname:port/ZoneID". Note the ZoneID is case sensitive and must be entered exactly as it appears in the SIFWorks ZIS Console.

7. Type an optional description in the Description field. This text will appear on the Console's main window.

8. Click the Members tab to select the schools that are members of this aggregate zone.

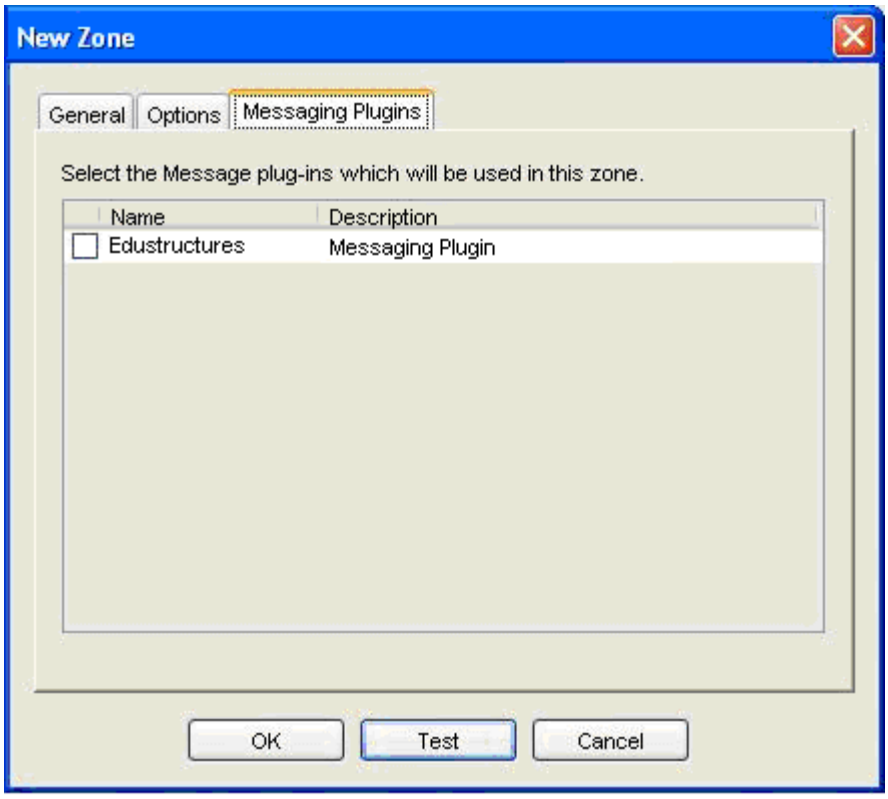


9. Click the Test button to test that the zone properties are correct. If the agent is able to successfully connect to the Zone Integration Server, a message box will be displayed indicating so. If an error occurs during the test, a message box is displayed with detailed error information.

10. Click OK to save your changes. The new zone is added to the Zones tree in the Agent & Zone Settings dialog box and is also added to the main window of the Console.

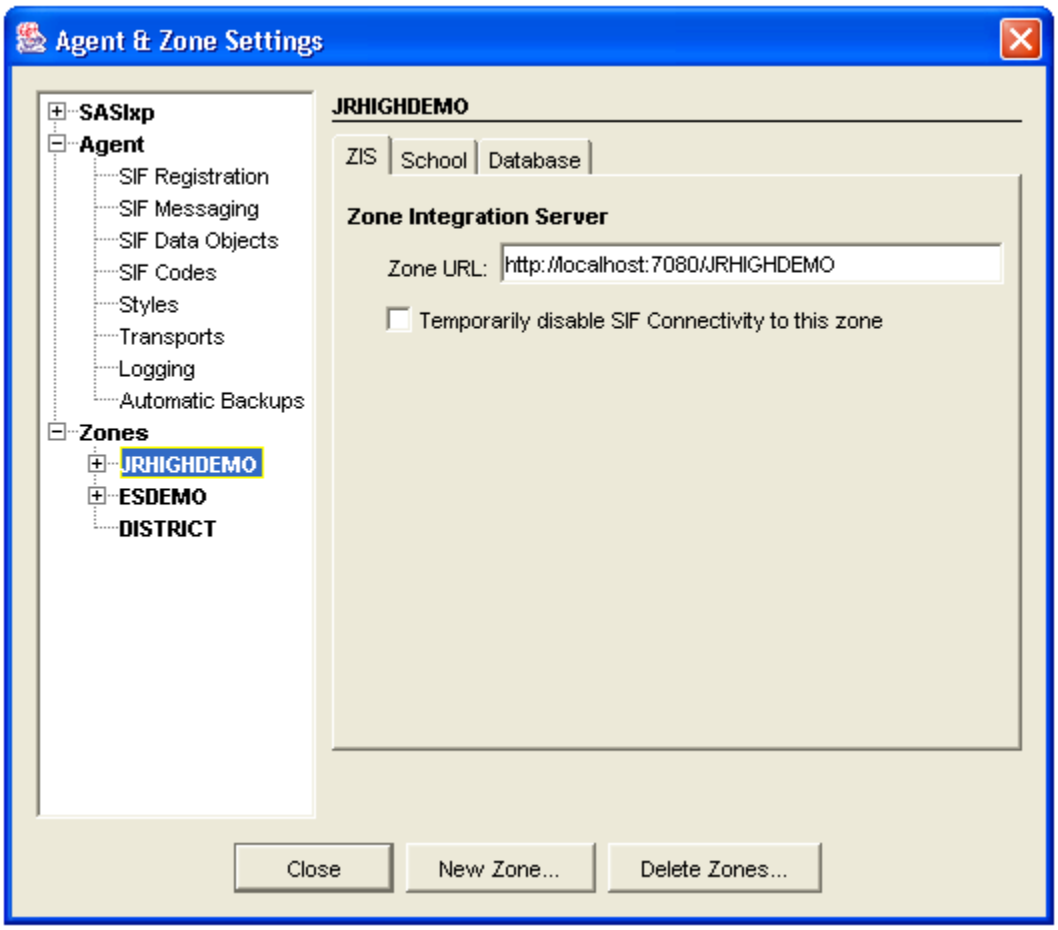
New Zones and Plugins

If you have Messaging Plugins installed, a third tab appears on the New Zone dialog. To activate the Messaging Plugins for a new zone, click the Messaging Plugins tab, select the checkbox next to the desired plug-in, and click **OK**.



Changing Zone Properties

Once a zone is created, it's displayed in the Zones tree on the Agent & Zones Settings dialog box. You can change zone properties at any time by highlighting the zone in the tree.



Temporarily Disabling a Zone

On occasion it may become necessary to disable all connectivity between a SASI zone and the zone integration server. For example, you may want to temporarily stop publishing data from a school but wish to leave the agent running so that other schools in the district continue to participate in SIF.

To disable SIF connectivity to a zone,

1. Select the zone in the Agent & Zone Settings dialog box tree

2. Click the "Temporarily disable SIF Connectivity to this zone" checkbox

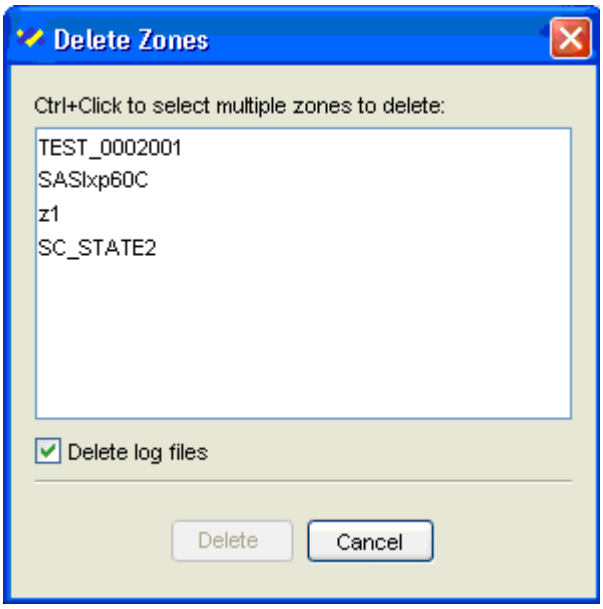
3. Close the Agent & Zone Settings dialog box. The zone's status on the main window will be shown as "Disabled" instead of "Idle".

NOTE: If this checkbox is selected and grayed out, it means a New Year Rollover is in progress. The New Year Rollover Wizard disables all zones. To ensure that an administrator does not re-enable a zone while a New Year Rollover is in progress, it also disables the checkbox.

Deleting Zones

Follow these steps to delete zones from the SASI agent:

1. Start the agent if not already running
2. Click on the SIF logo on the system tray to open the Console
3. Choose **Settings** from the Tools menu
4. Click the **Delete Zones…** button
5. The Delete Zones dialog box will appear



6. Select the zones to delete. You can select more than one zone by holding down the Ctrl key while clicking a zone in the list.
7. Click the Delete button to delete the selected zones

Deleting Object IDs

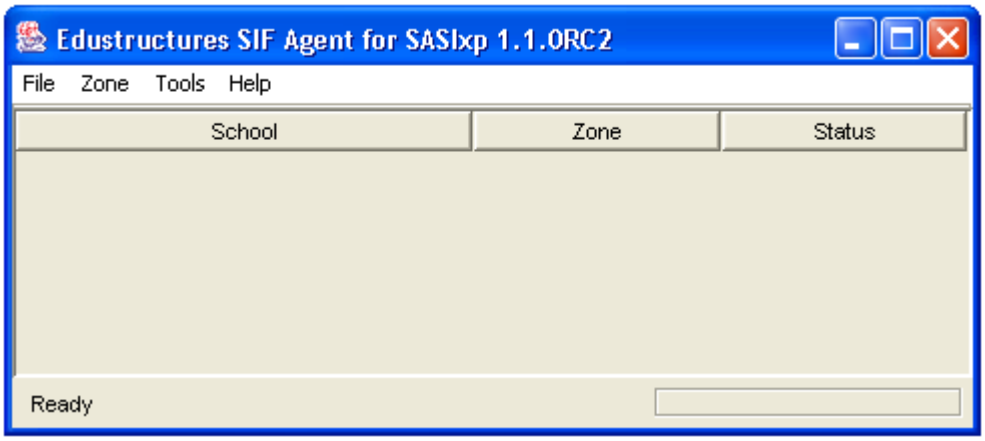
Check the "Delete Object IDs for school zones" checkbox to permanently delete all SIF object identifiers—or *RefIds*—associated with the school. While this does not impact records in the SASI database whatsoever, it does permanently remove the association between SASI records and their corresponding SIF Data Objects. Consequently, any SIF Agents that have already synchronized with the deleted zones will now reference objects that no longer exist.

Part III

ADMINISTRATION & ADVANCED CONFIGURATION

7. The Console

The SASI SIF Agent console is where configuration and administration tasks are performed. To open the console, click the blue and yellow SASI agent icon on the taskbar.



The Console's main window shows a list of zones to which the agent connects.

Zone Status

Although the SASI agent is designed to run unattended, the Console can provide a good picture of the activity taking place on each zone and whether any errors have occurred that require attention. The main window summarizes zone status with an icon and a message in the Status column for each zone.

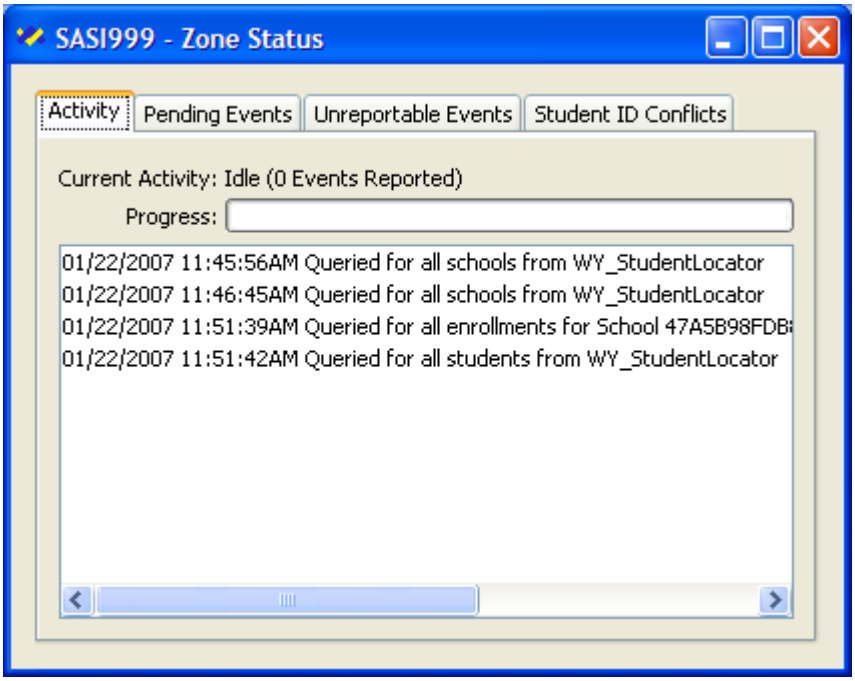
One of three status icons may be displayed beside a zone:

Icon	Status	Description
	OK	The zone is connected to both the SASI database and the zone integration server and is idle or performing activity, and Event Reporting is functioning properly if enabled. No attention is required.
	Warning	A warning condition has arisen that may or may not require attention: 1. Event Reporting has been suspended because of a database or network connection error. The agent will automatically retry the operation in 5 minutes. If the warning status persists, open the Zone Status dialog box as described below to investigate. 2. The zone is disabled—that is, an administrator checked the "Temporarily disable SIF Connectivity to this zone" option in the Settings dialog box, or the

New Year Rollover Wizard has disabled all zones during a rollover operation

	Error	An error condition has arisen that requires attention: 1. The SASI database is not available 2. The Object IDs Database is not available 3. The connection to the zone integration server is not available 4. Event Reporting has encountered a fatal error. Details are available from the Activity tab of the Zone Status dialog box. An administrator must manually re-start Event Reporting from this dialog box.

To view more detailed status information, open the Zone Status window by double-clicking a zone in the main window or choosing "Zone Status…" from the Zones menu.



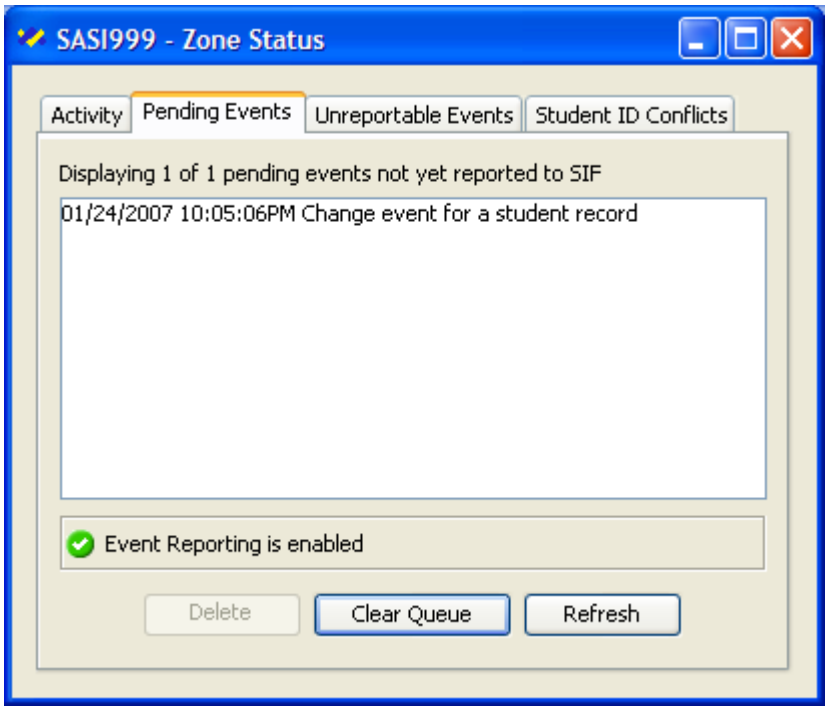
Activity Tab

The Activity tab lists the most recent 100 operations that have been performed on this zone. Whenever the agent responds to a SIF Request for data or reports a SIF Event, a new entry is displayed in the list. If the agent is performing an operation that may take some time to complete, the progress gauge will illuminate.

Note a permanent copy of the activity log is stored in the activity.log file in the agent's "\logs*zone*" directory. You can view this file in a text editor such as Notepad.

Pending Events Tab

The Pending Events tab lists the records from the SASI AEVT event transaction log that have not yet been reported as SIF Events. Because it may take some time to read from the SASI database when the agent is connected to a large number of zones on a slow network, the list does not automatically refresh. Click the Refresh button to update the display.



To clear all pending events, click the Clear Queue button. To delete a specific event, select it in the list and click the Delete button.

Deleting pending events is not generally recommended because the change information will not be reported to subscribing SIF Agents. Nonetheless, there are two cases when it is useful:

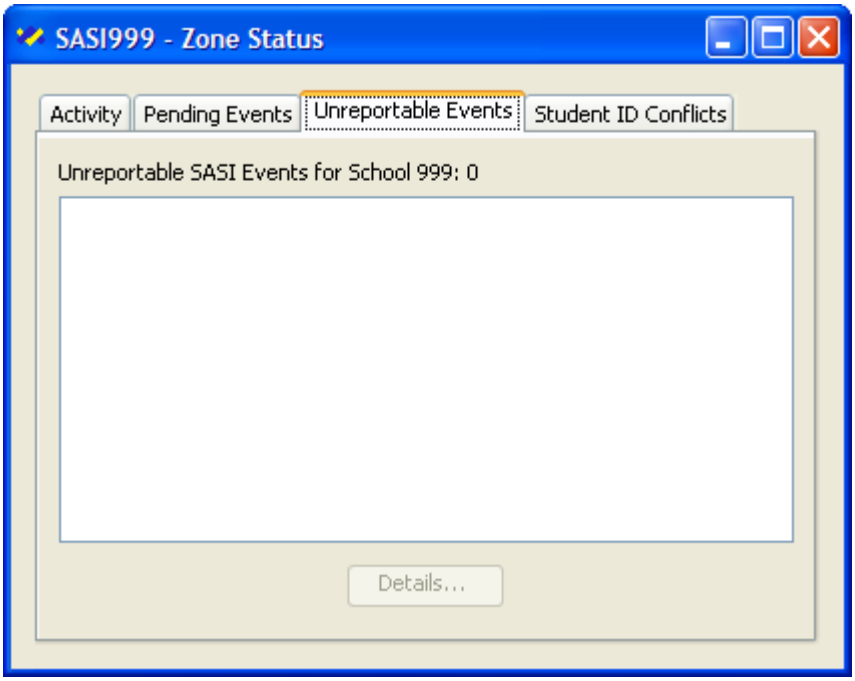
1. When Event Reporting has been disabled for an extended period of time (i.e. weeks or months), and you have since re-synchronized subscribing agents in the zone, it is recommended that the Clear Queue button be used to purge the AEVT file of all pending changes. Otherwise, the agent will report SIF Events that may reflect changes prior to the re-synchronization. This has the potential to introduce stale data into subscribing SIF Agents.
   This is a rare occurrence; most districts keep Event Reporting enabled throughout the school year.

2. In some situations you may find that the agent is unable to report a particular event because of a problem with the software or the SASI database. To "unblock" the queue, select the offending entry from the Pending Events list and click the Delete button.

In addition, the Event Reporting status is shown at the bottom of the Pending Events tab. If Event Reporting has been "suspended" or stopped because errors are preventing it from working properly, the icon and status message will reflect this state. A **Details…** button will appear from which you can view the error that caused Event Reporting to suspend or stop.

Unreportable Events Tab

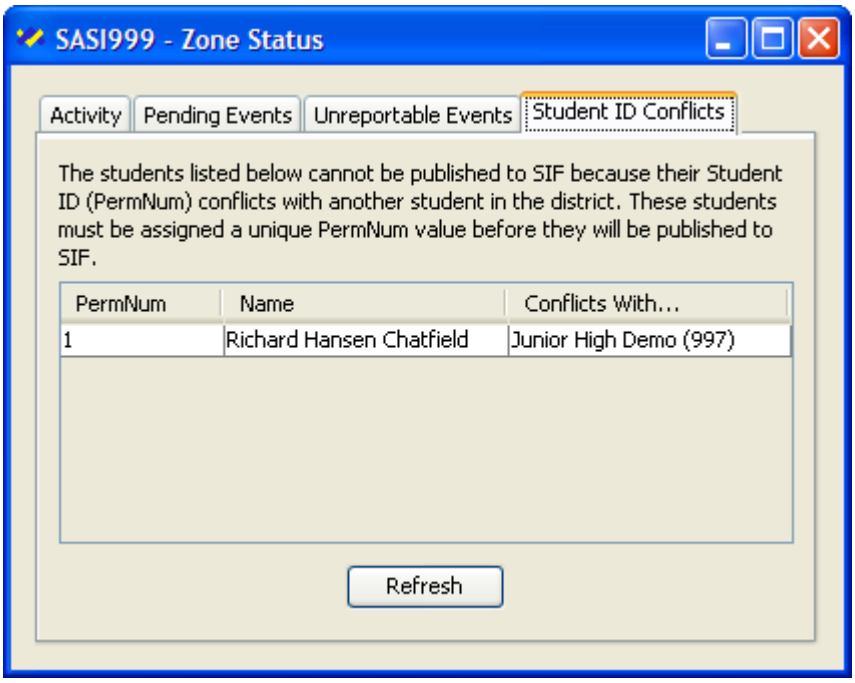
The Unreportable Events tab lists any data changes that could not be reported because of an error—usually a defect in the software or a customization to SASI that was not anticipated by the agent. To view the technical details associated with the event, select an entry in the list and click the Details button.



Student ID Conflicts Tab

The Student ID Conflicts tab lists the name of students who cannot be published to SIF because their Student ID (SASI PermNum field) conflicts with that of another published student in the district. When viewing the list, please note that the Student ID Conflicts screen does not automatically refresh itself, so you should periodically click the Refresh button to update the display.

Student ID conflicts are caused when two different student records have the same PermNum. This situation occurs because one student is erroneously assigned the same PERMNUM as another student who is already published to SIF. In the example below, student Richard Hansen Chatfield in the SASI999 zone has been assigned the same PermNum as a published student in SASI997 zone.



If the SASI Agent detects a PermNum conflict while trying to process an Add or Change event, it places the student information for the Add or Change event in a quarantine area in the SASI agent, where it remains until the conflict is resolved.

To resolve the problem, an administrator should use the SASI application to manually re-assign a unique PermNum value for each student with a conflicting Student ID. Once the students have unique PermNum values, their student information can be published to SIF. For information on how to change a Student ID on the Student atom (form) in the SASI application, please refer to your SASI application vendor documentation, under the section on how to change student information.

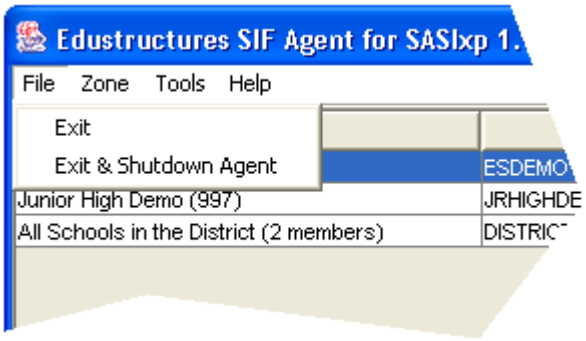
After conflicting StudentIDs are re-assigned unique PermNum values, the SASI Agent reads the new information from the SASI application queue, clears the conflicts from the agent's quarantine, and publishes the Add or Change events for the students to SIF.

The Menu Bar

The Console's commands are organized under three menus on the menu bar:

File Menu

The File menu is used to exit the agent:



Menu Item	Description
File	
Exit	Exits the Console but leaves the agent running. The SIF icon does not disappear from the Windows taskbar. This command has the same affect as closing the Console window with the X in the upper, right-hand corner of the title bar.
Exit & Shutdown Agent	Exits the Console and stops the SASI Agent. The SIF icon will disappear from the Windows taskbar. Alternatively, the agent may be stopped from the Windows Service Manager (when running as a Service) or by pressing Ctrl+C in the Java console when running as a standalone program.

Zone Menu

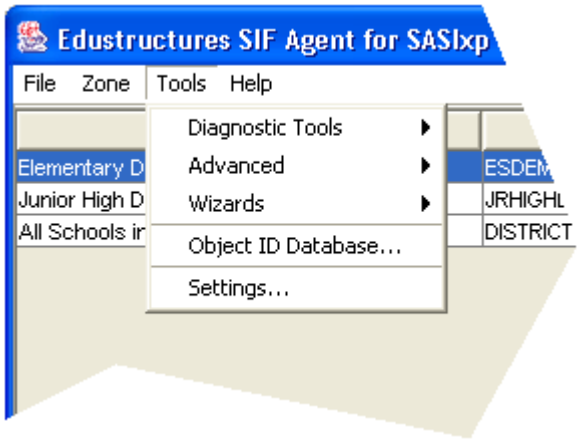
The Zone menu is used to manage connections to SIF Zones or to display the Zone Status window for the highlighted zone. Note that zones cannot be added and removed from this menu; instead, use the Tools > Settings… command.

Menu Item	Description
Zone	
Connect	Establishes a connection to the zone that's highlighted in the main window. This command is grayed out if the highlighted zone is currently connected.
Disconnect	Disconnects the agent from the zone integration server

	that manages the zone that's highlighted in the main window.
Control > Sleep	Informs the zone integration server that the agent does not wish to accept any messages. This command is grayed out if the agent is currently sleeping. Note: The agent normally places each zone in Sleep mode when the NT Service is stopped.
Control > Wakeup	Wakes up a zone that has previously been put into Sleep mode. Note: The agent normally wakes up each zone when the NT Service is started.
Control > Ping	Sends a "SIF Ping" request to the zone integration server for the highlighted zone to verify that the agent and server are connected and communicating.
Zone Status	Opens the Zone Status window from which you can view activity and status information regarding the highlighted zone. NOTE: You can also double-click a zone in the main window to open the Zone Status window for that zone.

Tools Menu

The Tools menu is used to access the Agent & Zone Settings dialog box and the Object ID Database status window, as well as to perform specialized administrative tasks such as manually generating SIF Events for SASI records.



Menu Item	Description
Tools > Diagnostic Tools	
SASI Database Performance	Opens the SASI Database Performance dialog box to test how quickly the agent accesses the SASI database for each zone.
SASI Event Monitoring	Opens the SASI Event Monitoring dialog box to check the event monitoring configuration of SASI at each school. This tool should be run at initial installation time. It prepares a report of the SASI database files and

	fields that are monitored for changes, and also offers an option to repair the configuration if it is incompatible with the requirements of the agent.
Tools > Advanced	
Prepare Enrollment Data	Opens the Prepare Enrollment Data dialog box to optionally prep student enrollment records for SIF. This tool should be used at initial installation time. The preparation of enrollment data is normally handled automatically the first time an agent requests enrollment records from a school. However, this process can be very time consuming if the agent is accessing SASI data files over a slow network connection. It is much faster when performed ahead of time using this tool.
Tools > Wizards	
HTTPS Wizard	The HTTPS Wizard assists administrators in creating digital certificates and configuring the agent's transport protocols for secure HTTPS communication with the zone integration server.
New Year Rollover Wizard	The New Year Rollover Wizard must be used both before and after the SASI New Year Rollover procedure. It reconciles student identifiers in the new school year with identifiers stored in the Object ID Database, reports SIF Events by comparing new school year data to the previous year's, and cleans out the AEVT Event Transaction Log so that changes made to the database during the NYR procedure are not propagated to the SIF infrastructure.
Tools	
Object ID Database…	Opens the Object ID Database status window. Here you can view the status information regarding the database where all SIF identifiers are stored for SASI records. Some commands, such as backing up and restoring the database, can also be performed from the status window.
Settings…	Opens the Agent & Zone Settings dialog box

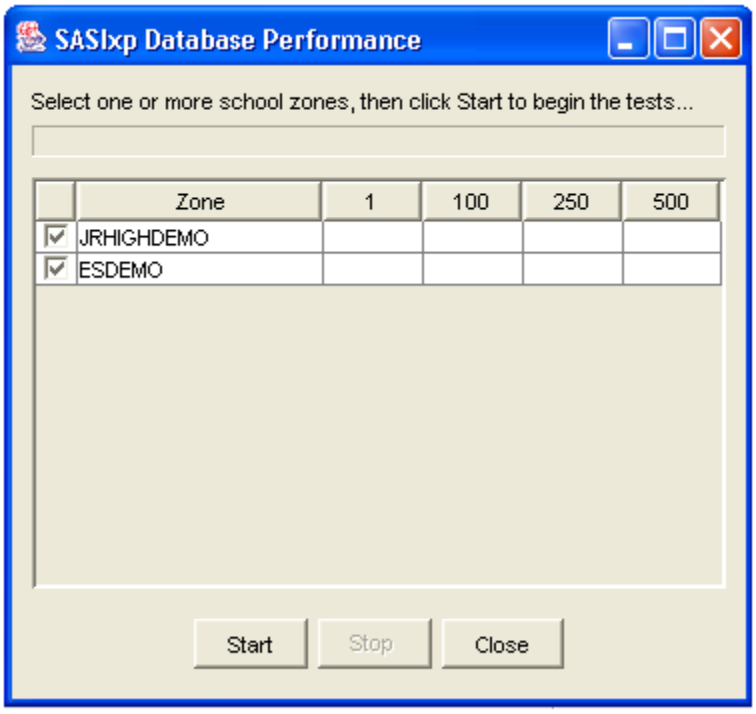
8. Tools

The SASI Database Performance Tool

The **SASIxp Database Performance** tool, found on the Console's **Tools > Diagnostic Tools** menu, prepares a report showing the amount of time taken by the agent to read student records from each SASI school. This information can be helpful in determining the relative speed at which the agent accesses SASI databases over the network compared to accessing database on the local computer. It is also used to note the speed of the agent at different times of the day and in diagnosing performance-related issues after installation.

To prepare a SASI Database Performance report,

1. Start the agent if not already running
2. Click on the SIF logo on the system tray to open the Console
3. Choose **SASIxp Database Performance** from the Tools > Diagnostic Tools menu



4. Optionally exclude one or more zones from the test by clearing the checkboxes
5. Click the Start button to run the report

When the report is complete, the results are written to a log file in the agent's "logs" directory.

Interpreting the Results

This tool works by first reading *all* student records from the SASI database. The time taken by this operation is displayed in the first column, labeled "1". Next, the tool enumerates the first 100 students in the list, querying the database for each student individually, and displays the time taken in the second column labeled "100". The time to perform this test will be significantly greater than the first test because the agent must issue 100 individual queries to the database instead of just one query. This test is again performed for the first 250 and 500 students in the list, respectively, with the results displayed in the "250" and "500" columns.

If the SASI database is located on the same computer as the agent (i.e. the agent does not need to access data files over the network), the results will be similar to what's shown below for a school with 800 or so student records.

1	100	250	500
2 seconds	5 seconds	13 seconds	30 seconds

800 students – dBASE IV access on local computer

When the agent is connected to this same school over a 100MB LAN network connection, the SASI Database Performance tool shows that database access times are increased but still acceptable (3 seconds to request all students from the school versus 2 seconds):

1	100	250	500
3 seconds	30 seconds	84 seconds	179 seconds

800 students – dBASE IV access over the LAN

When the agent is accessing dBASE IV files over a very slow network connection—in this case a 256K VPN link—the results differ considerably. In this case it took 92 seconds to read all students from the school versus the 2 or 3 seconds above. Given these results, the administrator might decide to install the agent on the same computer where SASI's data files are located to avoid the slow network connection:

1	100	250	500
92 seconds	seconds	seconds	seconds

800 students – dBASE IV access over a very slow 256K network connection

The SASI Event Monitoring Tool

The **SASIxp Event Monitoring** tool, found on the Console's **Tools > Diagnostic Tools** menu, prepares a report showing the database files and fields that SASI is configured to monitor for the purpose of reporting SIF Events. It's also capable of repairing the event monitoring configuration if it does not contain the entries needed by the agent for proper operation.

The SASI Event Monitoring tool should be used after initial installation to verify that event reporting is configured properly. Edustructures Technical Support may also have you run this tool to help diagnose problems with SIF Event reporting.

Background

When the database "monitoring" feature of SASI is enabled, SASI keeps track of all changes made to its database so that they can be reported as SIF Events by the agent. When a change is made to a monitored field—for example, a new student is added or a student's telephone number is edited—the change is recorded in the AEVT Event Transaction Log file. The agent periodically checks this log for new entries; if any are found, they're reported as SIF Events and removed from the file. This is the basic underlying mechanism that makes it possible for SASI to support SIF event reporting.

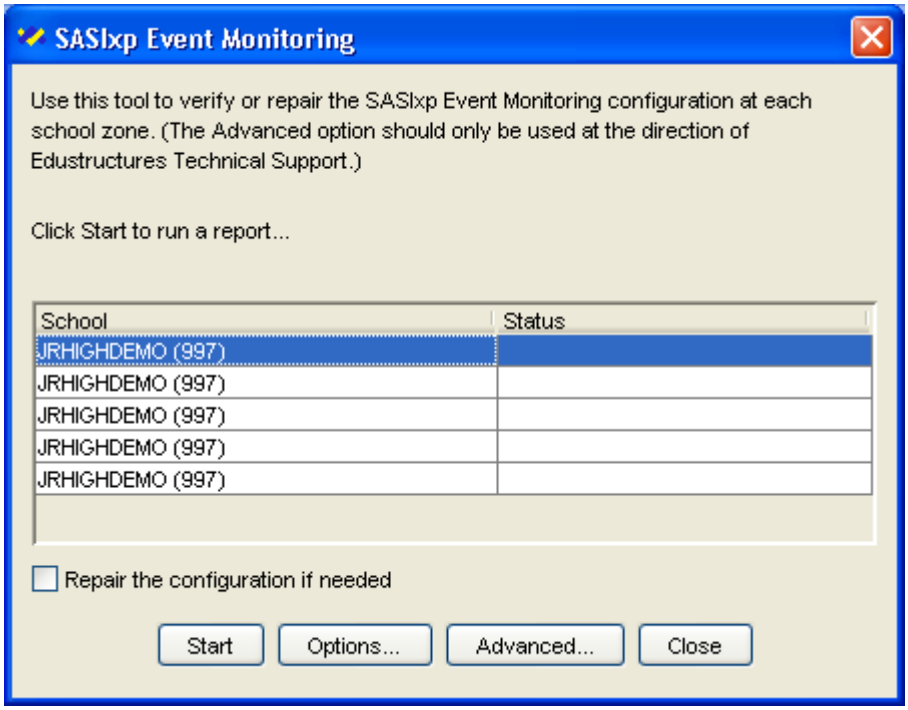
For performance reasons, SASI does not monitor *all* database files and fields because only a small subset of these are actually used by SIF. Instead, it monitors only the specific files and fields listed in the configuration files AFLM and AFDM. Thus, the way the agent tracks changes to SASI records is determined by the configuration of SASI and not the configuration of the agent. If the AFLM and AFDM files do not contain the expected set of entries, the agent won't function properly.

Some versions of SASI—especially patches to the software—include varying AFLM and AFDM files that do not always contain the required set of files and fields expected by the SIF Agent for proper operation. To ensure these files are compatible with the agent, it's recommended that administrators replace them with the AFLM and AFDM files included in the agent's "extras" directory. Alternatively, you can use the **SASIxp Event Monitoring** tool to analyze and repair these files if needed.

Using the Tool

Follow these steps to use the tool:

1. Start the agent if not already running
2. Click on the SIF logo on the system tray to open the Console
3. Choose **SASIxp Event Monitoring** from the Tools > Diagnostic Tools menu



4. Click the Start button to run the report

When the report is complete, the results are written to a log file in the agent's "logs" directory. The "Status" column will indicate if repairs need to be made to the configuration. If so, click the "Repair the configuration if needed" checkbox and click the Start button again. This time the tool will add the necessary entries to the AFLM and AFDM files at each school so that event monitoring will function properly.

▸ IMPORTANT: If the tool indicates that it has made changes to the AFLM and AFDM files when the Repair checkbox is marked, you must run a Reorg on these two files from SASI's File Management folder and then restart the SASI application for the changes to take effect.

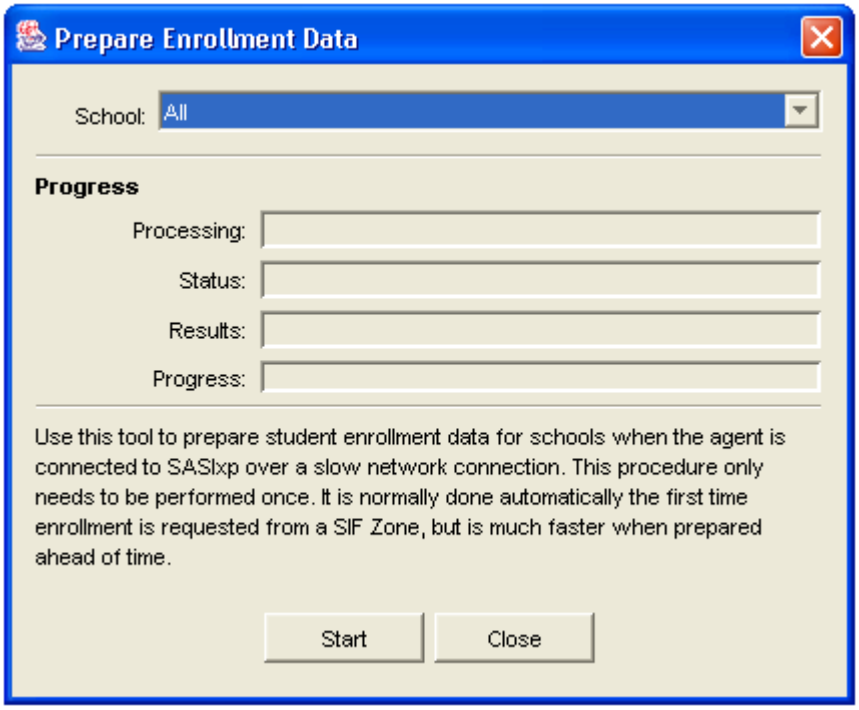
The Prepare Enrollment Data Tool

The **Prepare Enrollment Data** tool, found on the Console's **Tools > Advanced** menu, populates the agent's Object ID Database with SIF RefIds for all student enrollment records. This processing is normally handled by the agent the first time enrollment data is requested from a zone, but can take a very long time to complete over a slow network connection. To avoid this initial performance hit, you can use the Prepare Enrollment Data tool to force the agent to populate its Object ID Database ahead of time.

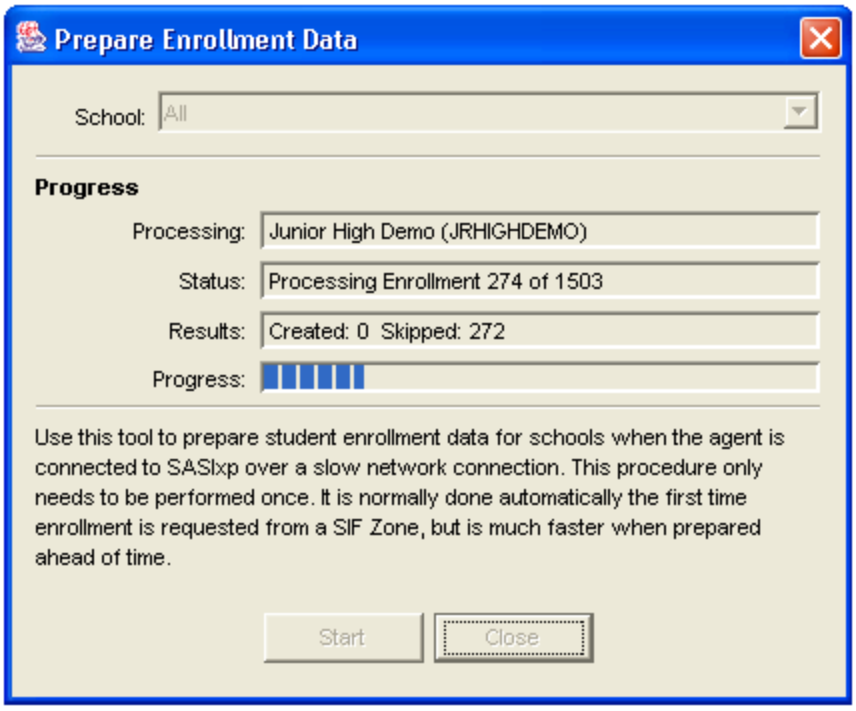
▸ NOTE: This optional procedure is automatically performed when a new zone is created. The Prepare Enrollment Data tool is available so that administrators can manually perform this task in the event the New Zone dialog box encounters a database or connection error.

Follow these steps to use the tool:

1. Start the agent if not already running
2. Click on the SIF logo on the system tray to open the Console
3. Choose **Prepare Enrollment Data** from the Tools > Advanced menu



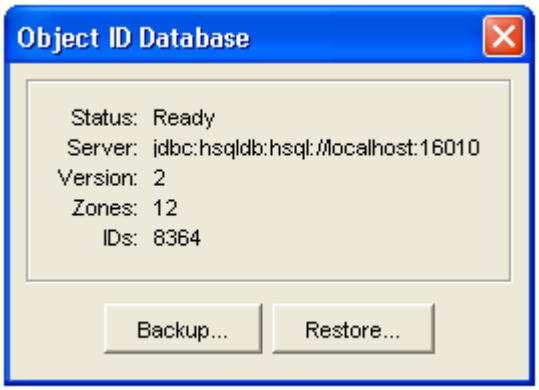
4. To prepare enrollment data for a specific school, choose it from the "School" combo-box. Otherwise, choose "All" to run the tool on all school zones.
5. Click the Start button



Object ID Database

The Object ID Database is an integral part of the agent that must be running at all times. This database is used to store the unique identifiers, or "RefIds", of each SIF Data Object, and also includes information to associate each RefId with its corresponding record in the SASI database.

To view the status of the Object ID Database, choose **Object ID Database** from the Tools menu. The following dialog box appears:



If the database is on-line and the agent is connected to it, the **Status** field shows a value of "Ready".

The **Server** field displays the database driver, server address, and port of the database. If the Object ID Database is running on a different computer than the SASI

agent, you can verify that the agent is configured with the correct address and port number here. (See the Advanced Configuration section for more information about changing the location of the Object ID Database.)

The **Version** field is the version of the database schema in use—currently version 2. Earlier releases of the SASI agent used version 1. If an upgrade to the database schema is available, an "Upgrade…" button will be shown at the bottom of the dialog box. Clicking this button upgrades the database in place.

The **Zones** and **IDs** fields indicate the number of zones represented in the database and the total number of RefIds recorded.

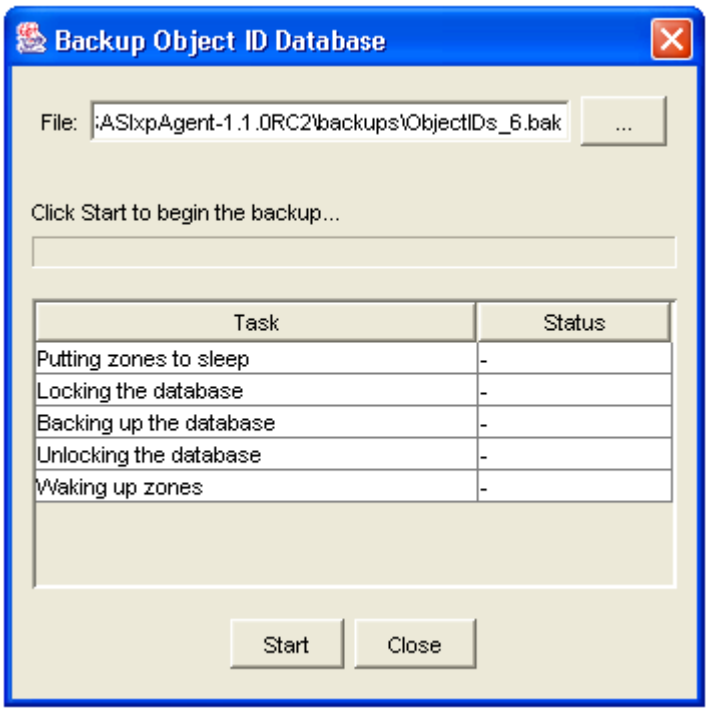
Backing up the Object ID Database

RefIds are important because they track the relationship between SASI records and SIF objects. If the Object ID Database is damaged or lost for any reason, all SIF Agents that have requested SIF objects from SASI will need to be resynchronized because the identifiers for these objects would no longer exist and new ones would be generated by the agent. Consequently, you should make a regular backup of the Object ID Database so that it can be restored if damaged or lost.

When Automatic Backup is enabled (the default), the agent backs up the database daily at a set time. Refer to the *Automatic Backup Settings* on page 49 for more information on the Automatic Backup feature.

To manually backup the Object ID Database,

1. Start the agent if not already running
2. Click on the SIF logo on the system tray to open the Console
3. Choose **Object ID Database** from the Tools menu
4. Click the Backup… button. The Backup Object ID Database dialog box appears:



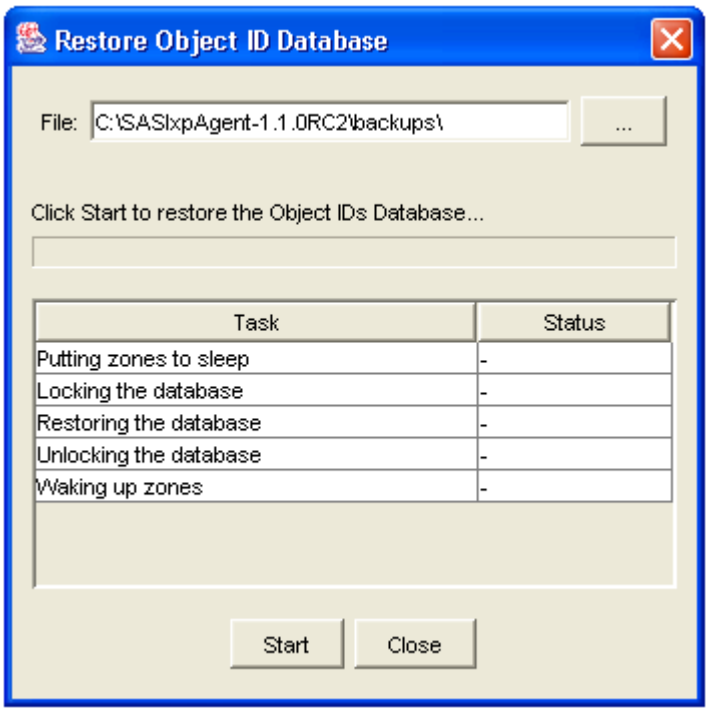
Type the name of the backup file in the **File:** field, then click the Start button. All entries in the database are written to the backup file you specify. Note that backup files are simply text files written in a special format that the agent can understand; you can view them in Notepad or another text editor.

Note that prior to performing a backup, all zones are put to sleep to prevent SIF activity from interfering with the backup process. When complete, all zones are woken up.

Restoring the Object ID Database from a Backup

To restore the database from a backup file,

1. Start the agent if not already running
2. Click on the SIF logo on the system tray to open the Console
3. Choose **Object ID Database** from the Tools menu
4. Click the Restore… button. The Restore Object ID Database dialog box appears:



Browse to the backup file or type the name of the file into the **File:** field, then click the Start button to restore the database.

▸ IMPORTANT: Restoring the Object ID Database from a backup file completely replaces all records in the database with the RefIds in the file. In other words, the database is first cleared of all records before the restoration is performed.

Part IV

ADVANCED CONFIGURATION

9. Security

The SASI agent communicates with zone integration servers using the HTTP or secure HTTPS transport protocols. HTTPS is a secure version of HTTP commonly used by e-commerce websites. It provides for both encrypted and authenticated communications so that data sent over the network is not only protected from view but also verified to be exchanged between two parties that trust one another. HTTP works the same as HTTPS but does not offer any encryption or authentication capability.

Authentication

HTTPS may be used in two modes:

- Server Authentication
- Client & Server Authentication

When Server Authentication is used, the zone integration server presents its security credentials to the SASI agent for verification each time the agent sends a message to the server. If the agent does not trust that the server is who it claims to be, the connection is not established. With Server Authentication, the agent knows that it is transmitting SIF information to the zone integration server instead of to a third-party claiming to be the zone integration server.

When Client Authentication is used, both sides of the communication present their security credentials for verification. Client Authentication ensures that the zone integration server sends SIF messages to the SASI agent at a specified server address, so that another party cannot act as an imposter by registering its own SASI agent with the server.

With both Server Authentication and Client Authentication, the entity asking for a certificate must *trust* that certificate for the communication to proceed. This trust is established when both parties have one another's digital certificate on file.

Preparing for HTTPS

To use HTTPS you'll need:

1. A digital certificate signed by a trusted Certificate Authority (CA). You have at least three choices for obtaining a certificate: Create your own "self-signed" certificate using the SASI agent's HTTPS Wizard; establish your own Certificate Au-

thority with software available from Microsoft, Netscape, and others; or purchase a signed certificate from a third-party CA such as VeriSign.

2. The zone integration server's digital certificate. You'll import this certificate into the agent's "truststore"—a file that keeps track of the certificates the agent will trust when establishing connections to zone integration servers.

In addition, when using Client Authentication the zone integration server will need a copy of the SASI agent's certificate as well so that it can trust the agent. Consult your ZIS documentation for instructions on setting up HTTPS at the zone integration server.

Creating and Importing Certificates for HTTPS

The first step in configuring the agent to use HTTPS is to create a *private key* and a *keystore* that contains that private key. A keystore is a file that holds keys and certificates. When the agent is installed, its keystore files—`Agent.ks` and `Trusted.ks`—are empty. The `Agent.ks` file stores the private key and public certificate of the SASI agent, while the `Trusted.ks` file stores the certificates of zone integration servers that are trusted by the agent.

Method 1: Creating a Self-Signed Certificate

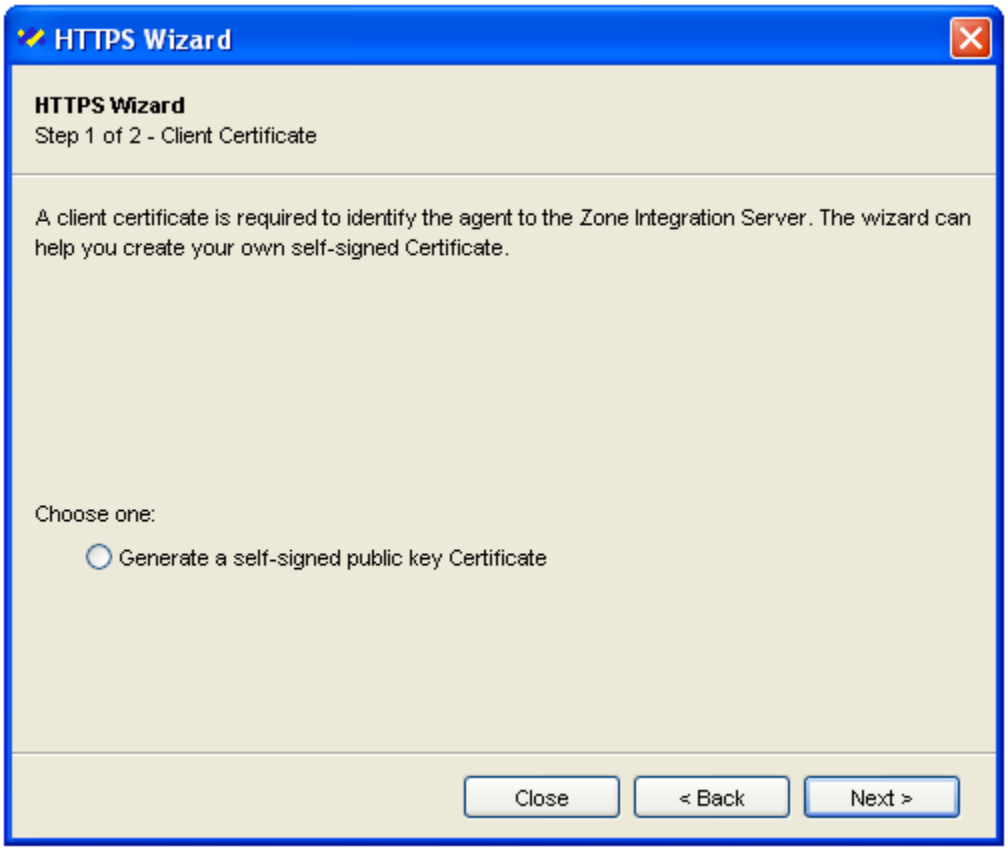
The easiest and least expensive way to create and prepare signed public key certificates is to simply create your own. These so-called "self-signed" certificates are not signed by any third-party Certificate Authority and are trusted only by you.

Follow these steps to create a new self-signed certificate for the SASI agent:

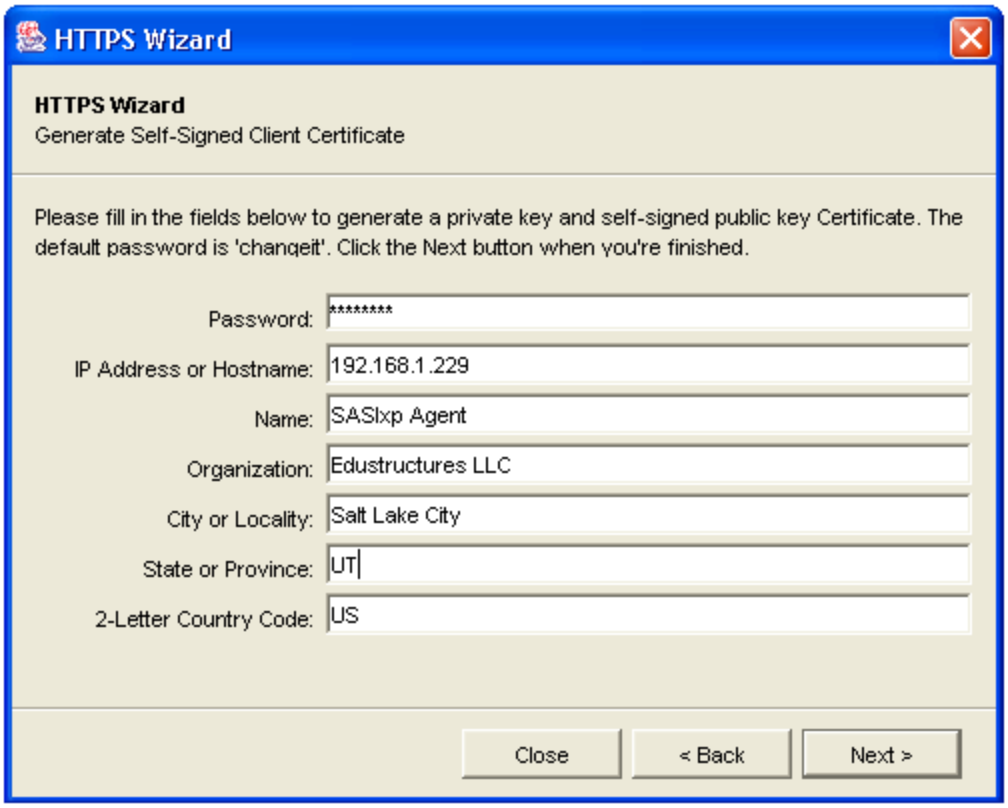
1. Start the agent if not already running

2. Click on the SIF logo on the system tray to open the Console

3. Choose **HTTPS Wizard** from the **Tools > Wizards** menu



4. On the second page of the wizard, choose the first radio button: “Generate a self-signed public key certificate”, then click the Next button.



5. Fill in the fields.

   Password: If this is the first time you've run the wizard and the agent's keystore files do not yet exist, enter the password you want to assign to those files. The default is "changeit". If you've previously used the wizard and the agent's keystore files have already been created, enter the password that you used to initially create the files. Again, the default is "changeit".

   IP Address or Hostname: Enter the IP address where the agent is running

   Name, Organization, City, etc. These fields are optional but recommended.

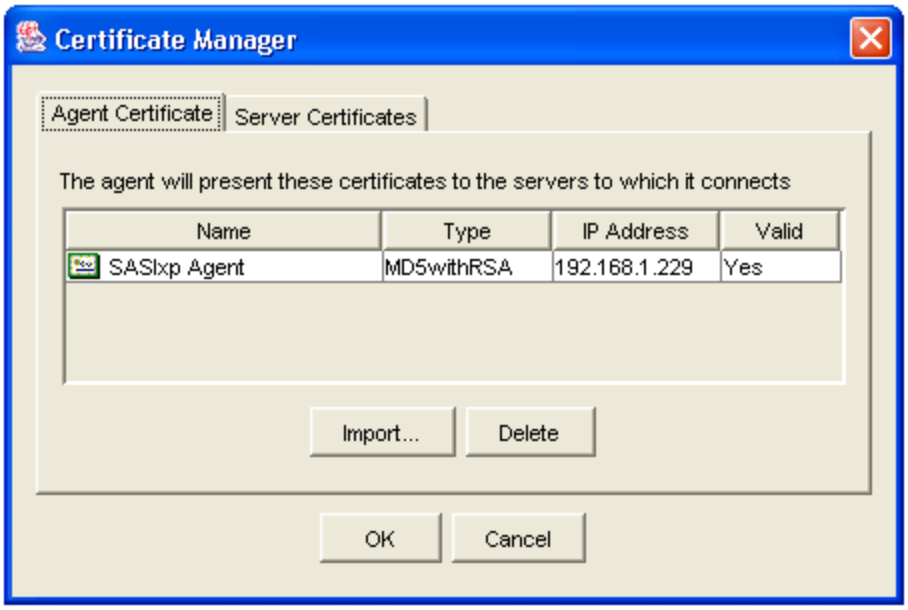
6. Click next to generate a certificate and import it into the agent's keystore.

When the wizard has completed, click the Finish button to close it. Next, follow the steps below to verify that the wizard created a certificate and imported it into the agent's keystore:

7. Choose **Settings** from the Tools menu

8. Click on the Transports node in the tree, then select the HTTPS tab

9. Click the Certificate Manager button



This dialog box shows the Agent Certificate in the `Agent.ks` file, which is modified by the HTTPS Wizard and should now consist of one entry having the IP address or hostname you entered in step 5 above. The Server Certificates tab lists the trusted zone integration server certificates that are stored in the agent's `Trusted.ks` file. You can use the Import and Delete buttons on this dialog box to manually import digital certificates instead of using the HTTPS Wizard.

Trusting the Zone Integration Server's Certificate

Now that you've created a self-signed certificate, the second step in setting up HTTPS is to obtain the zone integration server's certificate so that the agent will trust it when establishing a connection to each zone. This can be done with the by clicking the Import button on the Server Certificates page of the Certificate Manager (shown in the previous section); or, you can use the HTTPS Wizard to import the server certificate.

Follow these steps:

1. Using the tools provided by your zone integration server product, export its digital certificate to a file. This file will be imported into the SASI agent so that the server is trusted when establishing a connection.

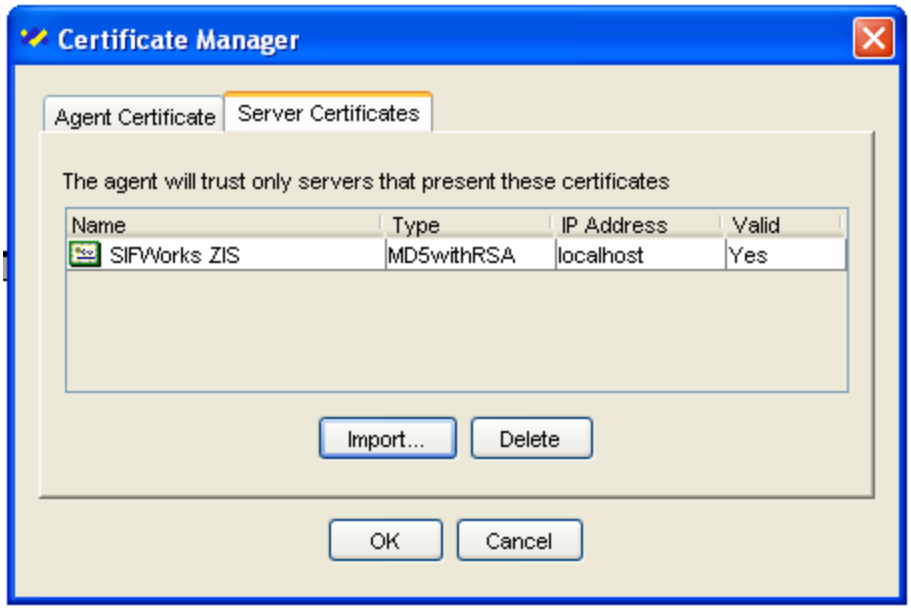
2. Start the agent if not already running

3. Click on the SIF logo on the system tray to open the Console

4. Choose **Settings** from the Tools menu

5. Click on the Transports node in the tree, then select the HTTPS tab

6. Click the Certificate Manager button



Click the Server Certificates tab to display the zone integration server certificates trusted by the SASI agent. To import your ZIS certificate, click the Import… button and browse to the certificate file that was exported in Step 1. Click OK to save your changes. The SASI agent is now configured to trust the certificate of your zone integration server.

Configuring the Agent & Zones for HTTPS

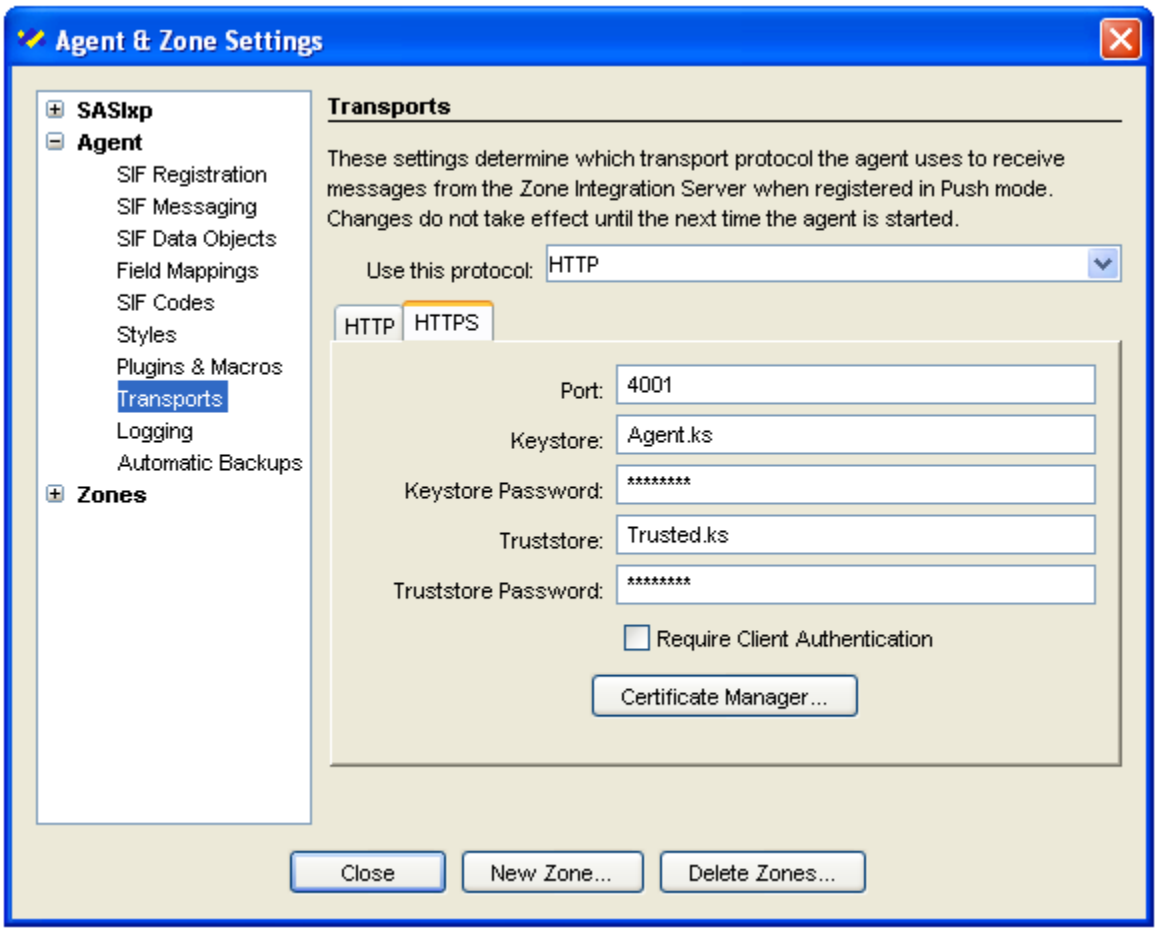
Once certificates have been configured as described in the preceding section, the final step to enabling HTTPS is to change the agent's transport protocol and zone settings.

Transport Protocol Settings

When the agent runs in Push mode, it establishes an HTTPS port to listen for incoming traffic sent by the zone integration server. The transport protocol and port settings are configured in the Agent & Zone Settings dialog box.

Follow these steps to set the transport protocol to HTTPS

1. Start the agent if not already running
2. Click on the SIF logo on the system tray to open the Console
3. Choose **Settings** from the Tools menu
4. Click the Transports node in the tree



5. Select HTTPS from the "Use this protocol" combo-box

6. Click the HTTPS tab and verify that the field values are correct. Here you can specify a port number to listen for incoming traffic, change the agent's keystore and truststore files, and enable Client Authentication. By default, the SASI agent uses port 4001 for HTTPS connectivity. If another application is using this port you can change it to another value.

7. Close the Settings dialog box and restart the agent for the changes to take effect

Zone URL Settings

The zone integration server URL of each zone must match the protocol used by the agent. For example, if the agent's transport protocol is set to HTTPS as described in the preceding section, then the URL of each zone must be changed to "https://". Follow these steps for each zone the agent is connected to:

1. Start the agent if not already running

2. Click on the SIF logo on the system tray to open the Console

3. Choose **Settings** from the Tools menu

4. Select a zone in the tree

5. On the Zone Integration Server tab, verify that the URL begins with “https://” if the agent is configured to use the HTTPS transport protocol.

6. When the Settings dialog box is closed the agent will reconnect to each zone using the new URL

▸ NOTE: In this version of the SASI agent, all zones must use the same transport protocol, and it must match the protocol selected in the Settings dialog box. You cannot, for example, configure some zones to use HTTP and others to use HTTPS.

Part V

MAINTENANCE PROCEDURES

10. New Year Rollover

This section sets forth the basic SIF-related New Year Rollover instructions for each listed Student Information System (SIS). Please consult your vendor's documentation for more general information about the New Year Rollover process.

SASI and the SIF Agent New Year Rollover Wizard

The SASI SIF Agent requires that a New Year Rollover procedure be performed when transitioning from one school year to the next. This procedure is automated by the New Year Rollover Wizard, found on the `Tools > Wizards` menu of the agent's Console. There are four phases to complete a New Year Rollover as outlined below.

☞ **WARNING:** Do NOT begin the SIF NYR process unless the SIF zone is ready to stop publishing current year data. Once the SIF NYR Wizard is started, data can no longer be published from the current SASI school year. The district can be at any point in the SASI New Year Rollover process (Non Student, Student, Graduate/Archive).

Phase A Run the SASI Agent's New Year Rollover Wizard as described in the section titled "Run the New Year Rollover Wizard and select 'It's the end of the current school year'"

Phase B Proceed with any outstanding SASI application New Year Rollover procedures

Once you have completed the SASI application's Final Rollover and are ready to use next year's database, follow these steps:

Phase C Run the SASI Agent's New Year Rollover Wizard described in the section titled "Run the New Year Rollover Wizard and select 'It's the beginning of a new school year'"

Phase D Resynchronize any SIF Agents as necessary

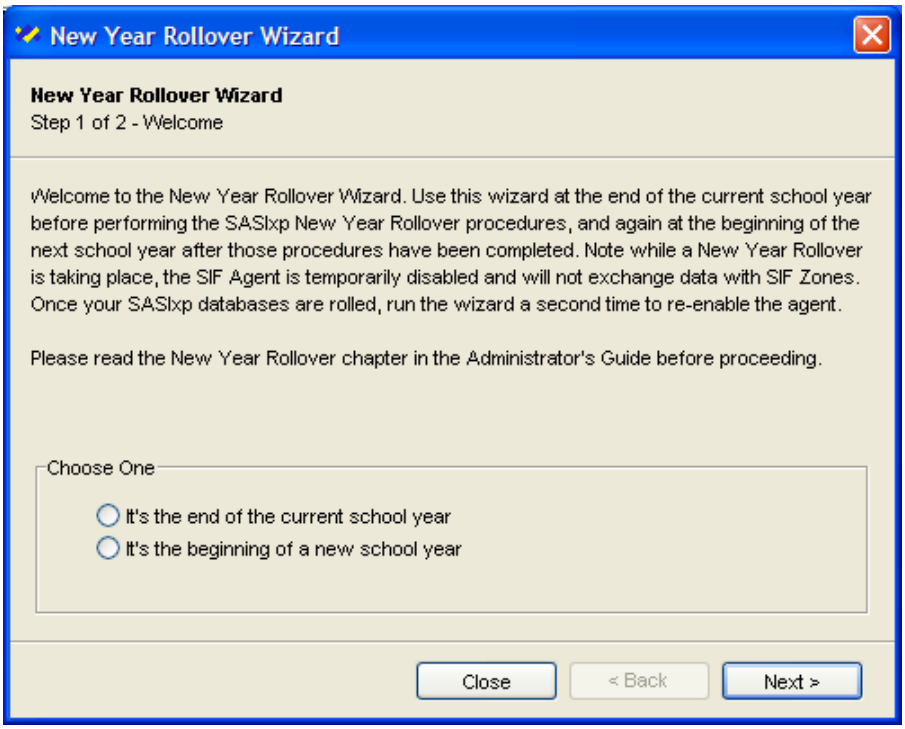
☞ **IMPORTANT:** Once the SASI Agent's New Year Rollover Wizard has been used to advance to the next school year, the process cannot be reversed. For example, you cannot publish data from the 2005-2006 school year, rollover to the 2006-2007 school year, and then switch back to the 2005-2006 school year.

The agent's New Year Rollover Wizard should be used in conjunction with the SASI application's New Year Rollover procedures.

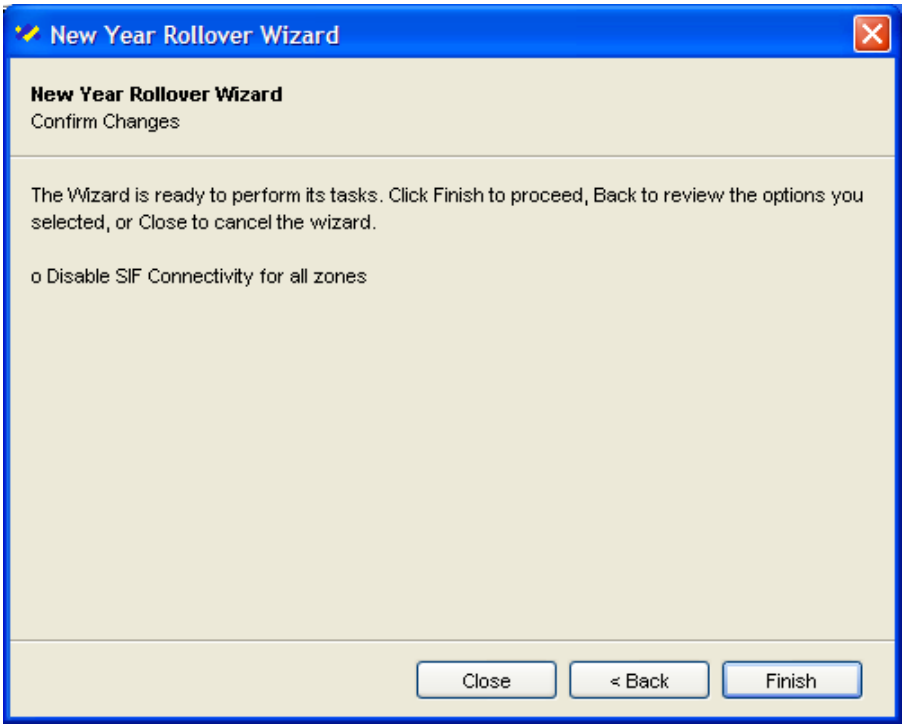
Phase A. Run the Wizard and Select "It's the end of the current school year"

1. Open the SASI Agent Console.

2. Choose `Tools > Wizards > New Year Rollover Wizard...` from the menu.



3. Choose "It's the end of the current school year" and click **Next**.



4. This screen describes the actions the wizard is about to perform. Click **Finish** to proceed.

After you click **Finish**, the wizard performs the following SIF maintenance task:

- Disables the agent's connectivity to each SIF Zone.

  This is a precautionary measure to prevent the agent from sending SIF Event messages and responding to SIF Requests while a New Year Rollover procedure is in progress.

5. An alert window displays to confirm completion of the process. Click **OK** to complete this phase.

After running "It's the end of the current school year," all zones display a warning icon ( ) in the agent and those zones are in a disabled state. New students added to the SASI application will no longer result in notifications to other SIF Agents while the zones are disabled. A report window also opens in the background. You can close the report window after Phase A.

Phase B. Perform SASI New Year Rollover Procedures

In Step B, you should perform any remaining New Year Rollover procedures in the SASI application. For many districts this is an iterative process that may take some time to complete. When you've completely finished with the SASI Final Rollover and are ready to publish next year's data to SIF, proceed with Step C.

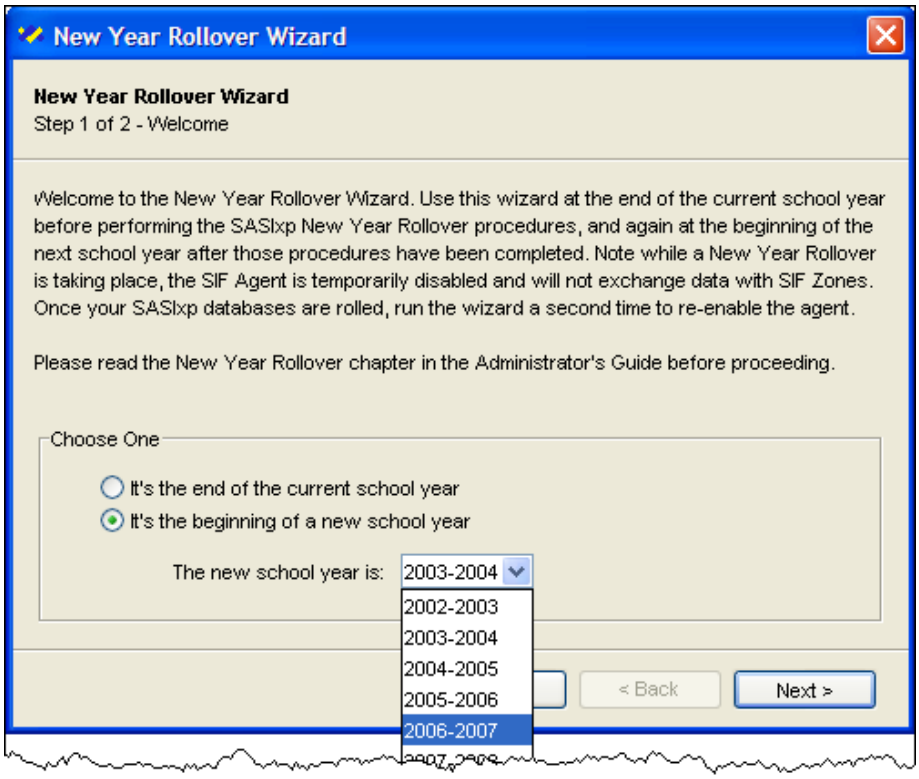
Phase C. Run the Wizard and Select "It's the beginning of the new school year"

1. Open the SASI Agent Console.

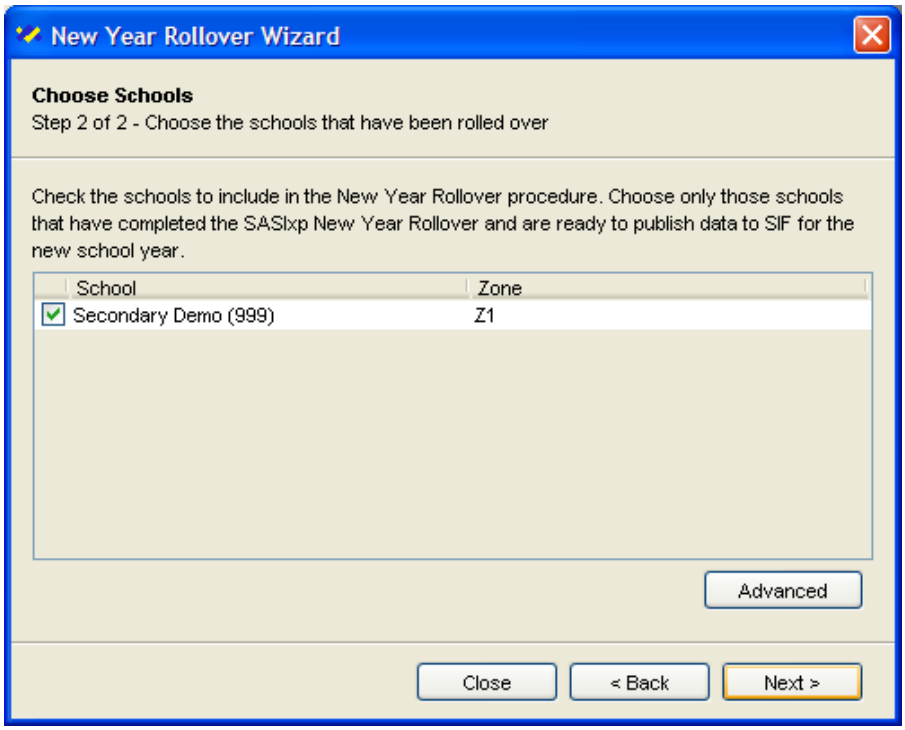
2. Choose `Tools > Wizards > New Year Rollover Wizard...` from the menu.

3. "It's the beginning of a new school year" is selected by default. If it is not selected, select the "It's the beginning of a new school year" option.

4. Choose the appropriate school year from the combo-box:



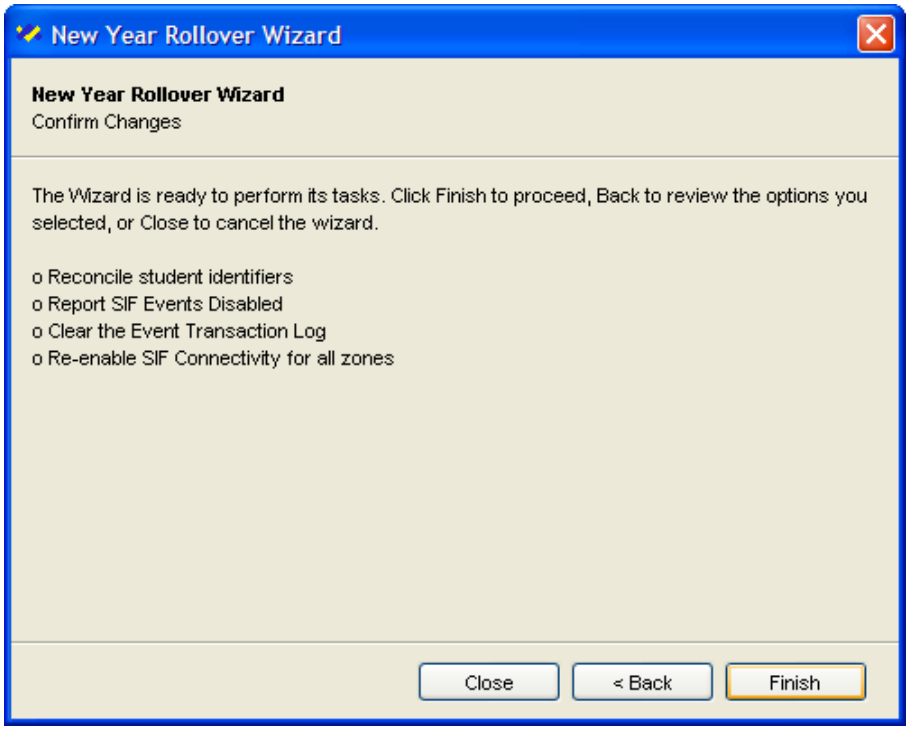
5. Click **Next** to proceed.



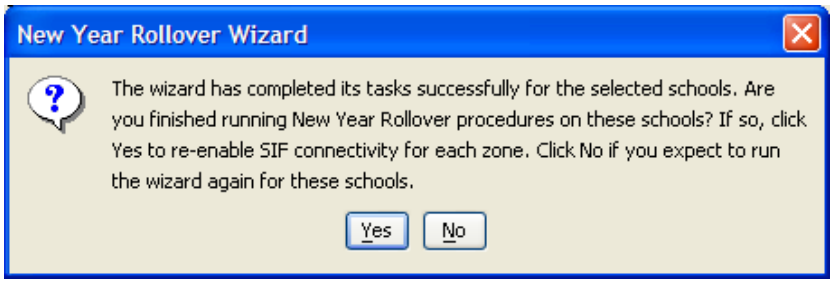
6. Choose the schools that have finalized the SASI New Year Rollover process and are ready to advance to the next school year. (You may choose to run a subset of schools and later return to the Wizard to complete the remaining schools. To run a subset of schools, select the target schools, run the process, and verify a successful run. Then repeat phase C with another set of schools.)

Note: The Advanced button — The Advanced button contains the option to activate the reporting of SIF events. (Reporting is disabled by default.) **It is highly recommended that "Report SIF Events" is not selected so that events are not reported during this step.**

7. Click **Next** to proceed.



8. This screen describes the actions the wizard is about to perform. Click **Finish** to make the changes.



9. Upon completion of this phase, the wizard prompts you to enable the zones or leave the zones disabled. If you are finished with the New Year Rollover for all schools, click **Yes**. If you need to run the "It's the beginning of a new school year" section again for one or more schools, click **No**.

After completing the New Year Rollover Wizard, a report window opens in the background. This report lists all of the SIF-related updates made by the wizard for New Year Rollover processing (a copy of the report is also found on disk in the agent's log directory). You can close the report window upon successful completion of running the New Year Rollover update.

When running the "It's the beginning of a new school year" option, the wizard performs these SIF maintenance tasks:

- Reconciles identifiers in the SIF Object IDs database with new student identifiers

During a SASI New Year Rollover procedure, the internal "StuLink" identifiers of each student are changed. The agent uses these identifiers to associate SASI records with SIF Data Objects. During this step, the wizard reconciles student identifiers by updating the "StuLink" values in the agent's database to match those in the SASI database.

- Clears the SASI Event Transaction Log

  During the New Year Rollover procedure, the SASI Event Transaction Log file (AEVT) may be filled with records that should be deleted. The agent deletes all entries from this file before proceeding to the next step.

  NOTE: Edustructures recommends a Reorg be performed on the AEVT file after the New Year Rollover process has completed, as it may have grown very large during this process. Regular reorganization of the AEVT file will improve overall performance of the SASI Agent.

- Increments the school year for each SIF Zone

  When a SIF Zone is added to the agent, the administrator specifies the school number and school year. During this step, the school year is automatically incremented.

- Re-enables the agent's connectivity to each SIF Zone

Phase D. Resynchronize any SIF Agents as necessary

The resynchronization incorporates all of the changes made during New Year Rollover and allows other agents to subscribe to the new objects, thus aligning current data between SASI and other agents. Follow the instructions provided by each subscribing agent to resynchronize with the Student Information System.